

NEW WORLDS SCIENCE FICTION

No. 35

2/-



NEW WORLDS

— PROFILES —

John Wyndham



John Wyndham who, in two incarnations, has been writing stories which some consider to be science-fiction, and others do not, still finds himself afloat about the whole thing.

Sometimes it seems to him as if we need a new classification—on our left, the science-fiction story *veritable* where the gadget or the technical development is all that matters, and a few cut-out figures make the necessary standard moves, a kind of chess, in fact : on our right, the extra-polatory story in which people like us are affected by the shifting about them of the technological scenery and props.

The latter type strikes the real fan as old-fashioned, and consequently worthless and pointless : the others find the former mechanical and superficial, and therefore pointless, too. The chances of reconciliation are rare : take, for instance, an affectionate moment necessary to the plot. Both sides are more or less at one in admitting it a place, and also in perceiving that an embrace in a space-ship does not differ radically from an embrace in the cave ; but one faction says : "Okay, but we've had all that before, so if you can't skip it, just cut it down to a conventional phrase or so ; the other lot replies : If you don't introduce human motives and sympathy, what have you got beyond a box of conjuring-tricks and a stack of formulae ?"

So, Wyndham, having suspected for some time that the whole thing is a plot to promote schizophrenia in authors, has now decided that he can only go his own way—which he does, hopeful of entertaining at least some of the readers some of the time—and ready to be happy if this should, by chance, mean you.

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Interpretation . . .

During recent months more and more journals and periodicals in the general fiction field appear to be analysing science fiction and endeavouring to interpret its meaning, not only as a literature, but as to its meaning in the mind of the individual and its possible worth when combined with an objective ideology. Not many years ago science fiction was primarily a "two-party" argument—for or against it being "escapist literature"—but now it has wandered into practically every avenue of discussion encompassing politics, medicine, religion, advertising, merchandising and insurance and is being written about solely from the fact of the particular journal airing its views.

Already this year I have received a wide variety of such published 'articles' (and I would particularly like to thank the many readers who send me these off-trail clippings) ranging from an extremely erudite and searching enquiry published in *The Sociological Review* (an academic journal circulated to Universities), the medical journal *The Lancet*, the *Journal* of the National Book League, various film periodicals, *Cherwell* an Oxford undergraduate magazine, to as far Left as *World News* a Communist weekly. (Incidentally, in the latter, both *New Worlds* and *Astounding* were favourably reviewed because of their neutrality in current politics). All these articles have broken down science fiction and interpreted it according to their own individual outlook.

One of the most controversial subjects for discussion these days is the religious aspect—a delicate one even in general fiction, but far more complex when allied to stories located in some theoretical future Time. It is therefore of absorbing interest to find an article in the *Church of England Newspaper* approaching the subject from a theological angle.

In a front page article headed "Spaceships and Providence" the writer, John Wren-Lewis, endeavours to prove that "science fiction fulfils the religious needs of the new age," and makes an extremely good attempt at it despite his inaccuracy of assuming that *children* have been responsible for the popularity of the *genre*. He contends that science fiction supplies a spiritual need which has been missing since the 18th century. "People are just beginning to realise," he writes, "that science fiction holds out the possibilities of new discoveries and new extensions of human power undreamed of in our everyday philosophy . . . imaginations which see the problems of human life set in a far wider context than that of earth involving powers far greater than those of man. These imaginations in earlier times were essentially bound up with religion, and, in fact, there is an astonishing similarity between many of the themes dealt with in science fiction and those of religious mythology."

Mr. Wynn-Lewis feels that presentday stories parallel early religious beliefs—the electronic brain deputising for the superior wisdom the gods of old imparted to men and the phenomenon of ‘demonic possession’ being represented by hypnotic control or ‘thought waves’ (which we now call the psi powers). “May it not be,” he asks, “that imaginations of this kind express an essential part of man’s religious need, a need which was starved by the materialism of the 18th and 19th-century science but is now beginning to find expression under the patronage of the magic word “science” itself?”

This reasoning is only partly true, I feel, when considering how recent our present technology was formed. Previous to the 19th-century the educational status of the masses was so low that the word ‘science’ was often allied to that of “witch” or “warlock,” the apothecary dispensed pills and unguents by a hit-or-miss principal that either killed or cured, and earlier still the alchemist was theoretically linked with the Devil. Ignorance on both sides, plus the slowness of communications and verbal distortion in the re-telling are more likely to be the fundamental roots of much of our mythology.

Basically, however, Mr. Wynn-Lewis does not think that science fiction is escapist. “On the contrary,” he states, “the majority of science fiction stories show a very real awareness of our contemporary problems and more often than not express a gloomy view of them.” Contending that many such stories often point a sharp moral about human behaviour, he continues, “The introduction of the cosmic setting seems to highten rather than detract from the significance attached to human affairs, *and it is precisely this effect which I believe to be essentially religious.*” (His italics, not mine). “For is not religion the belief that human issues are of cosmic importance, and that in our struggle to achieve justice and love in our relations with one another the management of the Universe is, ultimately, on our side? Such a belief can only be expressed symbolically and I believe that is what the cosmic myths of earlier ages were doing.

“Superstition is the taking of symbols too seriously, as truths in their own right, and that is a menace to true religion because it *does* lead to escapism, just as a literal reliance on the intervention of Martians in our present international affairs would indeed be disastrous.”

There is plenty of room for discussion in the foregoing remarks and I do not propose adding to them personally—an editor’s job is to carefully steer his stories through the narrow shoals of overlapping creeds and ensure that he does not unwittingly upset any one particular religious group, for while the acceptance of one God is acknowledged by all faiths the method of acceptance differs considerably. I have no doubt, however, that when Man eventually gets out into space he will be duly humbled by the vastness of the galaxy and feel much nearer the Creator.

John Carnell



Following closely after his novelette The Star Walk in No. 33 Mr. White presents another intriguing idea—that of landing a damaged spaceship whose navigational instruments have been destroyed. It would be impossible, of course, but it presents a neat drama.

OUTRIDER

By James White

Illustrated by QUINN

In a glide that was only a few degrees off level flight the ship slid into the tenuous upper reaches of the atmosphere. The thin, practically non-existent air, made an almost solid thing by its tremendous speed of passage, tore at the gaping holes and ragged-edged projections in the once-streamlined hull, shaking the whole ship with a continuous, bone-jarring vibration. Rapidly the dull red glow of air friction grew along the leading edges of its gliding wings, on its blunted nose, and patchily about the torn and buckled plates that had once concealed the ship's radio, radar, and direct vision periscopic installations. Fearfully, like a great silver fish forced into exploring the depths of some strange and deadly ocean, it lowered itself cautiously into the Earth's atmosphere.

It had to land, and quickly. But its fear and hesitancy was understandable—the ship was deaf, dumb, and blind . . .

* * *

Gregg awoke with the dying echoes of one mighty gong-like note ringing in his ears, and to the sight of the ceiling rushing at him. The ceiling, after approaching to within six inches of his face, receded just as quickly, and the echo was abruptly drowned by sharp, urgent blasts of the Multiple Puncture signal. For an instant he lay too shocked to move, while the spring cables of his acceleration hammock—super efficient in the absence of gravity—flung him back and forwards across the compartment with a violence that made him sick and dizzy.

This, he thought crazily, is what the business end of a yo-yo feels like. Then the meaning of the signal registered.

Spacesuit !

Frantically he unzipped himself from the madly-oscillating hammock and kicked free. He skidded off one wall and stopped—violently—against another. The compartment's entrance where the spacesuit hung seemed to be miles away.

Five seconds later, as he was struggling with the top half of his suit and sweating because of the time it was taking, the alarm siren changed to the long-short-long pattern that meant No Immediate Danger. An indicator light above the door—placed there in case there should be no air to carry the sound of the hooter—flickered out the same information. Infinitely relieved, Gregg did the suiting-up operation with less haste, biting his lip several times at the pain shooting through his arm and shoulder.

Good thing the ship wasn't losing air fast, Gregg thought, or he'd be a very dead duck by this time. When his hammock had catapulted him against the wall he'd taken a bad crack on the elbow. It had slowed him down at a time when every second might have counted.

Only when he was encased in the suit and at least temporarily safe did he begin to wonder what exactly had happened to the ship. Gregg had an overwhelming urge to head for the control room and find out the worst direct from Captain Ferguson. But doing that, he knew, wouldn't be very bright. In an emergency like this ship's personnel were required to remain at their posts, and report conditions in their vicinity so that the Captain could get the over-all picture. If Gregg went barging into the control room now, asking questions and offering assistance when the duty officers were up to their ears checking damage reports, he'd no doubt be told where to go—his assistance and himself both. He'd better obey the rules.

Carefully avoiding the still-vibrating hammock, Gregg kicked himself towards the intercom set on the wall. He plugged in his helmet lead and tried to keep his voice steady as he said: "This is Gregg, in Storage Compartment 2, to Control . . ."

He stopped then, aware by the absence of crackle in his headphones that the set was dead.

Gregg forced down the surge of panic which rose in him. A dead communications set, he told himself reassuringly, didn't necessarily mean that the control room was wrecked; the collision may merely have loosened an already faulty connection in the wiring somewhere, or some other simple explanation like that . . . With an effort Gregg made himself stop his wild and senseless speculations, and tried to take stock.

He was travelling on the express passenger liner *Wallaby* enroute from Mars to Earth. But not for him was the Main Saloon with its tasteful decor, its soft music, and its almost-constant film shows. As a company employee travelling at a fraction of the fare payed by ordinary passengers, an acceleration hammock rigged in an empty storage compartment was good enough for him. He'd been left to the contemplation of the beautiful symmetry of a rivet-studded bulkhead, and to try, if the constant two and a half G's acceleration would allow him, to sleep.

But there was no acceleration now. The ship was in free fall, weightless, its drive having cut off automatically in the instant of the collision. That was one of the many safety devices built into the ship, Gregg knew; the *Wallaby* was so crammed with automatic controls and safety devices that one of the station officials had told him that her crew were taking money under false pretences by claiming to operate her. The ship ran herself, he'd been told almost seriously, and the only difference between crewmen and passengers was that the latter were heavily charged for the ride. Gregg, floating beside the dead intercom set, thought that servo-mechanisms were all very well until something unforeseen happened; then, of course, it was the fragile and inefficient thinking machines of flesh and blood who had to solve the problem.

But where were the crew anyway? Surely one of them should have come around to inspect this section by now? For all Gregg knew they might be dead. Everybody might be dead, but him. He shivered involuntarily; that was very unlikely. He'd better look around and keep his mind busy or he'd scare himself to death with thoughts like that.

The corridor outside was deserted but well lit. As Gregg pulled himself along the ladder and net arrangement covering one of its walls in the direction of the nearest cabin, the alarm siren shut off suddenly. Small scraping sounds—made probably by men moving about—grew out of the ensuing silence, and from somewhere came a continuous, insistent clicking noise. Gregg pushed open a door lettered "Engineer

—A-drive" and floated inside. A guage on the wall had already told him that air-pressure was normal so he opened his face-plate to make talking easier.

Peterson, the *Wallaby's* Second Engineer, was still wrestling with the bottom half of his spacesuit. There was a large bump growing on his forehead, a lot of blood on his right temple and jaw, and he was muttering steadily to himself. The things he was repeating weren't nursery rhymes. From the way he kept blinking and shaking his head Gregg suspected a touch of concussion.

"Er, Mr. Peterson," Gregg said. "What happened?"

"How the . . ." Peterson didn't know what had happened—his language while telling Gregg so was vivid. Gregg, who tried to keep a one-track mind in important matters, disregarded him as he caught sight of the compartment's intercom. He pushed himself over to it and plugged in.

"Peterson!" a voice crackled at him before he could get out two words. "I thought you were dead or something. Give me the picture down there man, quick!"

Stammering a little, Gregg told the voice that there was light and air, and no outward sign of damage. He added, ". . . But this isn't Peterson, Captain. Peterson is hurt, though not badly, I think. This is Gregg. Is there anything I can do?"

"Gregg?" There was silence for a moment, then: "Oh yes, the passenger in Storage Two." The voice became hurried. "You can give Mr. Peterson whatever first aid you can, then tell him to report on the condition of the Drive to me as soon as possible. After that you'd better just stay out of the way for a while. We appreciate your offer of help, Mr. Gregg, but you must realise that we require skilled, technical assistance. Anyone without a thorough knowledge of ship operation and construction would only get in the way. Sorry, but thanks anyway."

"Captain," Gregg said quickly. "I've some experience of mining and construction in weightless conditions. I could help patch the hull for you maybe. And . . ." He caught himself just in time. He'd almost told the other that he'd once served on a ship as well—which would, of course, lead to him naming the ship. He didn't want that. He was trying desperately to forget that he'd once been Gregg of the *Allendyne*.

The set made a hissing sound that might have been a great sigh of relief, then: "In that case we can certainly use your help, Mr. Gregg. Can you put on Mr. Peterson now—and Gregg," the voice added, "you can stop calling me Captain. This is Second Pilot Allerton speaking. The Captain is . . . ill."

The engineer had joined Gregg and had already plugged in while Allerton was talking. He said: "Peterson here. What happened, or can't you tell yet?"

No, Allerton couldn't tell him anything for sure yet. The Second Pilot wanted Peterson to check the A-drive unit and the chemically-fuelled landing motors. The panel in the control room said they were O.K., but he wanted an on-the-spot check to make sure. First of all, though, Gregg heard him tell the Engineer, he'd better see to the passengers. Nobody else could be spared to do this, it seemed.

But Peterson had an objection, a good one.

"I banged my face getting off the hammock," the Engineer said quickly. "Nothing serious—just bloodied it up a bit—but it isn't what you'd call a sight to inspire confidence in a nervous passenger. Maybe Mr. Gregg here could . . ."

"Oh, all right," Allerton interrupted testily. "What does *he* look like?"

"Superficially undamaged," Peterson replied, giving Gregg a careful scrutiny. Drily he added: "A bit green around the gills, of course, but with his helmet on they don't show."

"Right." Allerton had no time for levity. "Mr. Gregg will you make that your first job, please. Go to the Saloon, help any passengers needing it, and calm them down generally. If anyone is injured call for the Medic, but only if you have to, because he's very busy at the moment. Above all, keep them out of the control room until we've sorted this mess out. Understood?"

"Yes sir," Gregg said. "But can you tell me what has happened? They'll want to know—that and what their chances of survival are." He stopped, holding his breath unconsciously. He badly wanted to know the answers to those questions himself.

There was a pause. Gregg could imagine Allerton in the control room, weighing things in his mind, wondering how much he should divulge for general distribution. Then the Second Pilot spoke a few crisp sentences and Gregg had the picture as the other saw it.

"Is *that* all?" Gregg almost laughed in relief.

"That, as you put it, is plenty." Something in Allerton's voice made him feel vaguely uneasy again. "Don't of course, mention the radio-activity to the passengers—it isn't immediately important and would only frighten them. Better get cracking on it now."

Gregg left for the passenger saloon.

The strains of a slow waltz—played with great feeling by an orchestra that seemed to be all string section—met him as he entered the saloon, and, badly out of time with the music, eighteen hammocks swung

wildly to and fro. Gregg quickly began moving among the hammock cables, loosening alternate pairs so as to destroy their equilibrium and bring them to rest. He saw at once that there were no casualties. The mere fact of the passengers staying put instead of trying to escape from the acceleration hammocks had saved them the bruises and abrasions suffered by Peterson and himself. A few of them were looking a bit green, Gregg thought. To be on the safe side he gave these some simple instructions and a plastic bag each. He went to the tape-player, turned off the music, and tried to look competent and reassuring.

They were a pretty varied bunch, Gregg saw; not the type to panic easily. Construction and mining engineers, ecological technicians, and representatives of the Earth-based business concerns that supplied machinery and material to the flourishing Mars colony were the sort of people that made up the passenger lists of most interplanetary ships, and the occasional tourist had to be extremely wealthy to indulge in space travel purely for sightseeing. Gregg pulled himself across the room to a hammock where a small, frail-seeming woman of about sixty was lying with her eyes closed, apparently unconscious.

This, would undoubtedly be a tourist. She probably had the constitution of a plough-horse, he thought bitterly as he reached out to shake the boney shoulder, otherwise she'd never have been allowed to travel at all. But his bitterness, he knew, was born chiefly of envy—envy of a physical condition which, unlike his own, could take normal acceleration indefinitely. He didn't allow the feeling to show in his voice as he began reassuringly: "You're perfectly safe, ma'm. There is no danger—"

He broke off in surprise as the old woman opened her eyes slowly, twinkled them at him, and said: "I'm all right, son. I was just thinking." The voice sounded small and frail like the rest of her. "I was wondering what could have hit us such a wallop 'way out here." She shook her head in gentle bewilderment, and began talking to herself about cometary orbits and meteorite shoals—all in the highly rarified language of the calculus! Gregg, aware that his mouth was hanging open, shut it and did a mental double-take. What sort of tourist was *this* . . .?

His baffled, faintly-amused speculation was abruptly cut short as a hand gripped his elbow—the sore one—and pain exploded through his whole arm. Gasping, he squirmed free and faced around. But he choked back the rush of angry words when he saw the passenger clearly.

"Yes?" he asked, trying to keep his voice and features neutral. He didn't think he succeeded very well.

"W-what happened to us?" The voice was low and would have been pleasant but for the discordance of fear and uncertainty running through it. Her hair was long and black, and—due to the absence of gravity—tufts of it stuck out in all directions. It reminded Gregg of a medusa, or maybe a drunken goliwog. He almost forgot the throbbing in his arm. As she brushed a tangle of hair out of her eyes, Gregg saw two things—they were a nice blue colour, and there was a glint of anger coming into them. The anger seemed to be directed at him.

Obviously she had mis-read his expression after grabbing his arm, Gregg thought; she must have thought his grimace denoted barely-concealed anger and disgust at her show of cowardice, or something like that. Women! He shook his head; he couldn't let her go on thinking like that. After all, he'd been in a worse funk five minutes ago himself.

"I don't know exactly, Miss," Gregg began, "but—"

"How bad is it, Mister?" a voice cut in roughly. "What chance have we got of—"

"What hit us?" a third voice shouted. In a few seconds everybody was talking at once. Gregg wriggled away from another hand reaching for his mis-treated elbow and yelled, "*Quiet!*" With a little twinge of shame then he remembered that he was supposed to be polite to passengers and he added, "Please." The babble of voices died.

"Ladies and gentlemen," he said, hoping he sounded briskly confident—the way a proper crew-man giving reassurance about some very minor mishap should sound. "You are in no immediate danger. As far as we know you are in no danger at all." He smiled, then went on: "But in case some of you may become worried unnecessarily, I'll explain the position as we know it."

As *I* know it, Gregg amended silently to himself. He was beginning to wonder if Allerton had told him the whole truth. Aloud, he said: "We were struck by a body of unknown size, fortunately moving at a speed relatively small with respect to ours. The collision caused certain safety devices to go into operation, one of which automatically shut off our A-drive and leaving us in our present weightless condition.

"The collision may have damaged our outer hull—but as not a single puncture has been discovered inside the ship, the damage, if any, must be slight. We have power, light, and an adequate air supply, so you can see that there is very little to worry about. A meteor either kills you or it just isn't worth bothering about.

"However, we're rather afraid that the premature shutting down of the A-drive will make course corrections necessary which will cause a few hours delay in our scheduled time of arrival . . ." Gregg was

ad-libbing a bit, but he knew enough to be pretty sure something like that would happen. Besides, it was sound psychology to be overly apologetic about a small thing; people rarely suspected then that there was anything big to merit apology. ". . . We are sorry about this and hope that it won't inconvenience anyone too much."

Gregg looked quickly at the faces of all the drifting bodies which engulfed him. They showed expressions of great relief, and little, if any, fear. There would be no panic, which was something. He said: "I suggest you all remain here and take it easy. The crew are very busy men at a time like this, and you'd probably get in their way if you went wandering about the ship—even though most of you would be anxious only to help us. The customary ten minute warning will be given before we begin acceleration."

As Gregg moved towards the saloon's exit, somebody said plaintively, "But we're not *supposed* to be hit by meteors. The probability against that happening . . ." The voice trailed off into silence.

"I know," Gregg agreed. "But just think, you all qualify for the Googol Club now." He was trying to catch the dark-haired girl's eyes, but she'd moved towards her hammock again, still angry with him. He shook his head; what difference did it make anyway? And he shouldn't allow himself to be side-tracked at a time like this. He was needed in the control room.

On the way out he re-started the tape player. The soothing strains of that wonderful string orchestra oozed from the matched wall 'speakers, and was quickly drowned by a rising hubbub of conversation.

"Chess, anyone?"

"Why can't we have modern stuff? This old-fashioned music just puts me to sleep . . ."

"What's a googol anyway . . .?"

The panel sliding into position behind him brought silence.

Membership in the very exclusive Googol Club should please them, Gregg thought as he pulled himself towards the nose section. Space was so big, and spaceships so relatively tiny, that in fifteen years of spaceflight less than sixty people had qualified. A well-known mathematician of a few decades back had coined the word "Googol" in order to describe probabilities of an extremely low order—virtual impossibilities, in fact. A 'Googol' was the numeral one followed by one million noughts, a very large number indeed, and one that came closest to stating the chances against meteoric collision in space. The Googol Club was an apt name.

The trouble was, Gregg thought grimly, in most cases the candidate died on attaining membership.

The control room was smaller even than he'd expected, and it was crammed with kicking, floundering bodies. It looked, Gregg thought, like an overcrowded goldfish bowl. Then he had another look and saw that there were only six people excluding himself present, and that the confusion was fairly orderly.

Three men were moving rapidly about exchanging dial readings and technicalities among themselves in low, urgent voices. A fourth hung over an acceleration chair containing a fifth, working over him and looking concerned. From the amount of gold braid worn by the figure on the chair Gregg knew that it was Captain Ferguson—and he really did look sick. The sixth man, who occupied the other acceleration chair, looked up as Gregg entered. His voice identified him as the Second Pilot, Allerton.

"I overheard you with the passengers," he said curtly, nodding at a speaker near him. "Nice work." Allerton's eyes shifted quickly to the recumbent Captain then, and there was silence. Gregg, feeling awkward, had his mouth half open to acknowledge the compliment. He shut it again; nobody was looking at him, everybody's eyes were on Allerton.

The Second Pilot was young, Gregg saw; very young—and he wasn't enjoying this situation at all. His thin, serious face was a pale, expressionless mask, but something that was very nearly panic was reflected in his frightened eyes. The Chief Pilot, or Captain, was the supreme authority on any spaceship; after him responsibility devolved upon the Second Pilot. But the overwhelming responsibility that had descended on Allerton was too much for him apparently, he wanted to get out from under it. Gregg understood and felt sorry for him—and considerably more anxious for the safety of himself and the rest of the *Wallaby's* passengers, if this was what they had to depend on.

Allerton said suddenly: "Mercer, what do you think?" His tone was brisk, none of the emotions he was feeling were allowed to show in it.

The man working over the Captain looked up. He wasn't much older than Allerton, but his mouth had a cynical twist to it that made him look as though he was. "I can't tell how serious it is without an X-ray," he said slowly, and shot a meaning look at the main control panel. "But one thing I can tell you, he isn't fit for duty."

There was another silence, during which the crew continued to stare at Allerton.

Abruptly the Second Pilot seemed to get a grip on himself. To Gregg the other still looked desperately afraid and unsure of himself underneath those rigidly disciplined features, but now the fear and anxiety were different somehow, as if sealed off in some separate compartment of his mind.

"Right," Allerton said. "You'd better leave him then, and take Gregg here and start checking the outer hull. That is the more important half of your job at the moment." To Gregg he said: "Mercer will show you what needs doing; go with him. And thank you for your assistance up to now, Mr. Gregg. We appreciate it."

The thanks, Gregg thought as he followed Mercer out of the control room, must have been a mere formula of words, a polite afterthought which Gregg's non-crew status made necessary. But Gregg didn't mind Allerton treating him as one of the crew. He hadn't minded it ten years ago . . .

Ten years ago.

Gregg had been Engineer on the *Allendyne*, a two-man freighter and one of the first to be powered solely by the Allen Drive. The A-drive, though a fast and highly-economical method of propulsion, had one serious drawback—it couldn't function within an atmosphere. That drawback didn't apply to the *Allendyne* however, because she was designed to remain in the vacuum of space until she fell apart through old age. Small, chemically-powered ferry rockets loaded or unloaded her cargoes while she held orbit well out in space. She was a slab-sided, aesthetically repulsive contraption—girders and grapples and cargo netting sprouted all over her—but functionally she was just about perfect. And she was *fast*.

The *Allendyne* broke speed and distance records, made new ones, and then broke those the very next trip. And so she continued, winning fame if not fortune for herself and her crew, until that last trip between Luna and Mars Station . . .

In those days there were no automatic controls or emergency cut-offs for the A-drive. When the delicate balance of the coils that focussed and accelerated the tremendous beam of ionised particles which powered the ship went out of alignment, and the defect could not be remedied, then nothing much could be done. The sweat broke on Gregg's back and forehead as he remembered it—the Drive going on the blink and beginning to deliver a wildly-variable thrust when they were two-thirds of the way to Mars, the battering they'd taken from acceleration that was five G's one minute, two G's the next, and anything from one to ten G's the minute after that. For days they'd been stuck in wet and stinking spacesuits—the erratic acceleration was shaking the *Allendyne* apart, it leaked air in every section—navigating by sheer guesswork. If there'd been chemical motors to fall back on they could have limped home on those. But they had to rely on a cranky electronic drive or else drift until they starved to death. The number of spaceships in existence was still too few for there to be any hope of rescue.



Somehow they had managed to kick themselves into an orbit around Mars. But when men from the station came to investigate, the *Allendyne's* Captain was dead from internal injuries, and Gregg had so many organs displaced that his X-rays looked scarcely human.

The Medics did a good job on him though, and in the weightlessness of the Mars space station the badly-strained heart mended itself and his displaced liver and etceteras worked themselves back into position—at least, so they had told him. But he had never joined another ship, though that was the only sort of life he wanted then—as Engineer he felt to blame for the whole *Allendyne* mess. Instead he'd taken a construction job on Deimos, always being careful to avoid any sort of high-acceleration travel.

The thought of high acceleration, and the memory of those three days of crushing, twisting pressure and the choking nausea, even after ten years, still made him feel like . . .

"Are you sick or something?" The voice of Mercer beside him brought Gregg back to the present with a jolt. He rubbed sweat off his forehead with a hasty palm, and said quickly: "No, just banged my elbow. It's nothing."

"Maybe I'd better have a look before we go out . . ." Mercer began.

Gregg shook his head. "What happened to Captain Ferguson?" He wanted to change the subject.

"I didn't see it myself," Mercer replied. "Allerton and I were off duty. I think he must have been helping me the way he usually does—you know, running out our retractable radar and communications gear in readiness for Turnover. To get at my control panel more easily from his seat he'd undone all but one of his straps, the one around his middle. When the crash flung him against it, it must have cut him in two." He stopped talking as they reached the airlock. Giving Gregg's open helmet a slap he said: "Seal up!"

So that was the aloof and awe-inspiring Captain Ferguson who had briefly shaken hands with him before take-off, Gregg thought as he closed his face-plate. Not the near-godlike commander of a super ship, but instead a kindly human being who didn't mind doing part of a crew-man's work for him. It had been a mistake, but there was an excuse for it.

Due to the interference set up by the ship's A-drive, radio communication of any sort was impossible while it was in operation. Radio checks and reports were made at Turnover time—a period lasting usually half an hour—when the Drive was shut off and the ship swapped ends preparatory to begin decelerating on the second half of its journey. Turnover was a very busy time for the communications officer, because all the vital equipment that would later be used in landing had to be checked, as well as the routine reports transmitted to his destination. It was the only period during which the communications man worked, and then he worked *hard*. For the rest of the voyage there was nothing for him to do at all. That was the reason the *Wallaby's* radioman doubled as ship's medical officer.

And even then, Gregg knew, Mercer's job was absurdly easy, requiring maybe six hours actual work per voyage. But when something like this turned up . . .

"All tight?" Mercer's voice came suddenly through the helmet phones. Gregg nodded, and his suit creaked faintly as Mercer broke the outer seal of the lock and air pressure disappeared. He attached

safety lines to Mercer and himself, moved the welder they'd be using into a handier position, and watched the port swing slowly open.

Half way open it stuck.

Mercer looked at the port as if he couldn't believe his eyes. He pushed at it with his hands, then braced himself and shoved with both feet. Looking suddenly worried he wriggled his head and shoulders through the narrow opening. Over the phones Gregg heard a sharply-indrawn breath, then Mercer's waist and legs followed his head and shoulders through the opening.

When nothing had happened for what to Gregg seemed a very long time, he said testily: "I'm still here, you know."

"Uh, I forgot." The voice was barely recognisable as Mercer's. After a pause it went on: "I'll give you a hand out. And you can leave the welder, we don't need it."

When Gregg had his foot magnets anchored firmly on the outer hull and had taken a look around, he saw what Mercer meant about not needing the welder. He found himself giggling suddenly, and shut his jaws with a snap.

What they needed was a new outer hull.

Every inch that he could see was covered with deep jagged-edged scratches, all running in the fore and aft direction. Some of the scratches were nearly an inch deep, and when one of these intersected a join in the hull plating, the metal was wrinkled and buckled like so much tinfoil. A few yards from Gregg, something that had once been a forty-foot retractable antenna system was nothing but a mangled stump that poked like some alien, metallic flower from its recess. Of the sliding panels which had covered it in its retracted position there was no sign at all; Gregg supposed they'd been torn away. But the ship's great, triangular gliding wings with their razor sharp leading edges seemed to have escaped damage completely. The stabilising fins were in one piece, too.

Gregg gazed about him with the objective curiosity which the dreamer brings to bear on a particularly horrible nightmare—when he is lucky enough to be aware that he *is* dreaming. This was impossible. No meteorite could damage a hull in this way; *nothing* he knew of could do it. Gregg swallowed and said as much to Mercer.

"Just under the skin is the most vulnerable spot," the radioman said softly, apparently talking to himself. Gregg wondered briefly whether it was the Communications or Medical half of the officer doing the talking, and if Mercer as well as Peterson had banged his head in the collision. He didn't like the sound of the radioman's voice, and the look in the other's eyes made him distinctly uneasy.

Mercer straightened. "I'd better check anyway," he said in the same toneless voice, and began sliding his magnetised boots over the hull towards the stern. Gregg followed.

By some miracle the outside extensions of the A-drive were undamaged, so also was the chemically-fuelled landing motor. Mercer and himself worked slowly from the stern forwards, examining every bent and buckled plate—and the wiring under them if it was visible. Mercer said very little, and Gregg didn't feel as if he was being any help at all. What was biting the other anyway?

At the bows, a few strands of steel wire deeply embedded in the plating told them the nature of the 'meteor' that had struck the ship. Some unknown ship at a time also unknown had lost its cargo net. The *Wallaby* had found it.

Mercer became quieter than ever.

In an effort to get a little conversation going Gregg said: "This is going to be a big loss to the company, isn't it? I mean, it would be cheaper to build a new ship than to repair this one. Luckily there's nothing wrong with our Drive or fuel tanks, though, or the controls. They'll be able to salvage those . . ." Gregg's attempt at conversation died and he felt his ears and face getting hot with embarrassment. Then he began to feel mad angry.

Mercer was looking at him, not saying anything. The look was of such withering scorn that Gregg felt like a child—and he hadn't been very bright as a child. Gregg didn't deserve a look like that from anybody. He was no tourist; he'd been space personnel once himself, the same as Mercer. He gritted his teeth in sheer rage and frustration. If there'd been enough air to support life outside his suit, there would have been a lovely fight under way just about now.

Mercer broke the silence at last.

"Will you please stop yapping about company losses and repair costs—you've no idea just how important I don't consider them. Look around you. Use the thing you call a brain as well as your eyes. Look there!" He indicated the *Wallaby's* once-sharp prow, now blunted and buckled, and with a tangle of wiring and small components oozing from between the damaged plating. "And there!" Mercer's finger pointed to the direct vision ports, then quickly to another section of the ship. "Can't you see that—"

"We're knocked about a bit, certainly," Gregg broke in angrily. "But that will be easily fixed on Earth. I certainly don't see why you're so blasted sarcastic about it."

"No, you don't see," Mercer said, and cursed. It wasn't a very bad swear-word, but Gregg had never heard any syllable used with such awful intensity. Then the radioman's manner changed abruptly

and he went on: "Space accidents are funny things, Mr. Gregg. At the time they happen it isn't always possible to tell how serious they are. Take this case, for instance.

"This ship is a total loss—with all hands."

As he moved towards the half-open airlock, he added self-consciously, "Er, sorry if I was impolite back there, Mr. Gregg . . ."

* * *

Nine men were packed into the *Wallaby's* tiny control room—the ship's full crew and Gregg—but the situation was too serious for anyone to see anything humorous in that ludicrous tangle of bodies. Mercer had just finished reporting his findings for the second time. Nobody had anything to say.

"On the face of it this looks hopeless," Allerton said at last. "But if there's a solution, we've got to find it *now*—or at least during the next couple of hours. Any ideas, please? Quickly." He was almost pleading with them.

Ever since Mercer had told him that the passengers and crew of the *Wallaby* were as good as dead, Gregg had been feeling more confused than frightened. At first he had thought Mercer guilty of a joke in rather poor taste, but the grim faces of the crew told him that they took the radioman's report seriously enough. But it seemed so silly. How could a ship be lost when it hadn't a single leak and it was fully powered and manned . . .?

Nobody was talking now, anyway. Gregg cleared his throat and said awkwardly, "I don't understand this. Why are things hopeless, and why are the next couple of hours important? We've light, air, power—"

"But we've no *radio*!" Mercer interrupted, angry impatience at this seeming stupidity putting a hard edge on his voice.

"I don't see—"

"Listen!" Mercer said. "You know what hit us. You saw the piece of cargo netting embedded in the nose, and the state the outer hull is in. But just so's you'll understand fully what happened, I'll tell you the whole sad story from the beginning—then maybe you'll be able to suggest something helpful . . ."

Gregg felt his ears beginning to burn again. Why did Mercer always make him feel about six years old? The radioman's words were polite enough, but the way he said them made it very plain that he considered Gregg a hindrance, if anything.

With an effort Gregg forced down his rising anger. Maybe it wasn't Mercer's fault; maybe it was himself who was being too touchy. It was downright stupid of him to expect the niceties of polite conversa-

tion from everybody at a time like this; he must look an awful stuffed shirt to them. Gregg tried to absorb the information content of the words, and not their tone, as Mercer continued :

"About an hour ago this ship hit—and ran through—a cargo net belonging to another ship. A cargo net is made of fine steel cable, highly flexible, and is anything up to three hundred square yards in area. It's used for transporting cargo on the outside of a ship's hull when the ship in question doesn't intend landing on a planet where air resistance would make streamlining necessary. A ship doesn't often lose its cargo net, but overloading, a sudden change of acceleration, or faulty fastening has been known to cause one to tear free of its ship. When this happens, the springy net opens out to its full area, forming a rare but very dangerous menace to navigation. So rare that we are the first to find out how deadly a menace it is."

Everyone knew all this, of course; but they listened closely. The simple statement of the problem facing them might suggest some line of attack which would never occur to them through dividing it up into highly technical and specialised pigeon-holes. Gregg hoped so anyway.

"Travelling at a velocity relatively small with respect to ours—any greater and we'd not be talking about it now—this man-made meteor hit us and went past.

"It practically sand-papered us flat."

Mercer took a deep breath and let it out by his nose. As radioman, this was the part which affected him most strongly. He continued: "Our retractable radio gear had been run out at the time, ready for use when the Drive shut down during Turnover, and for general testing. It was ripped away. *All* of it.

"The Approach and Landing radar, the fore and aft vision pick-ups, and the radio-altimeter and air-speed indicator—all of which were set more or less flush with the outer skin—are now heavily abraded junk. We can't call for help. We can't see to land. And if we were stupid enough to try landing blind, we can't have a 'talk-down' because we've no receiver. We're deaf, dumb, and blind—completely blind, because the direct vision ports are so badly scratched we can't see through them.

"And don't ask about safety devices and alternate circuits," Mercer anticipated as Gregg opened his mouth to put exactly that question. "The ship has them, all right, but they were under the outer skin, too. You know, this ship could have taken any ordinary collision—it could have as many punctures as a sieve—and still remain fully operable. But this was no ordinary collision. Instead of knocking a hole in us the way a meteor is supposed to, this one peeled us like an orange.

"The circuits which haven't been completely ruined are in such a mess that it would take weeks to salvage anything usable from them, and then building a transmitter while wearing a spacesuit is practically impossible. But we haven't got weeks, we've only a few hours—"

"But why a few hours?" Gregg interrupted. He was beginning to realise the full extent of the disaster, but surely somebody would be able to think of something, given time. The ship was only half-way between Mars and Earth. What was the big rush?

"Our course has been pre-set and timed," Mercer explained patiently. "Two-and-a-half G's acceleration from Mars to Turnover point, then half-an-hour for swapping ends and general checking up, followed by two-and-a-half G's deceleration to Earth. Once every five hours, acceleration is cut to one G to allow for natural functions, but that has been pre-calculated, too. That means we have to stick closely to our flight plan if we want to reach Earth in our present blinded state."

Mercer glanced quickly at his watch, then went on: "But the premature shutting down of the Drive when we hit the net upset the calculations—acceleration ceased approximately two hours earlier than expected. Therefore, in order to compensate for this, *deceleration* must be delayed by exactly the same time. In effect this means that the usual half hour Turnover period is extended to a little under six hours, and two of those are gone already.

"A method of landing the ship must be found within the four hours of weightless flight remaining before deceleration begins, because we can't do a thing during it but lie down, and when we arrive there won't be time to think or do anything." Mercer's mouth went through the motions of smiling, but his heart wasn't in it. "Add to that the fact of gradually mounting radio-activity in Storage Four—caused by the collision scattering the lead shielding bricks around the shipment of Mars-produced synthetic isotopes—which will *not* rise to fatal intensity if we can land and get away from this ship on time.

"That, Mr. Gregg, is the reason for all the rush."

Gregg wasn't really on a crippled ship, listening to a crew who intended flying her blindfold into a planet. It was silly, he told himself desperately; things like that didn't happen. But there was an ache in his stomach that wasn't from hunger, and the room temperature had nothing to do with the cold sweat that prickled suddenly on his forehead and back. This was true all right, and he'd just thought of something else . . .

The *Wallaby* might follow its pre-calculated course, but would the Earth be waiting at the end of it? In six hours Earth would have moved

a considerable distance along her orbit, and—Gregg felt his throat go dry at the thought—supposing the planet's orbital motion was *towards* them. They'd smash right into it.

Faces became even more white and strained as he relayed that thought to the others in the room. They hadn't thought of that.

Allerton reached for a scratch-pad and began doing some hasty calculations. Finished, he looked up and said: "It's all right. We'll be overtaking the Earth in its orbit, so the six-hour delay will mean that we come to rest a couple of thousand miles short. We can use the extra elbow room.

"But," he ended, his voice cutting sharply through the general sigh of relief, "We've still got to *land*, remember."

"Let's stop trying to fool ourselves," said a voice suddenly. It sounded, Gregg thought, like the Engineer, Peterson. "We can't possibly land, and you, as Pilot, know that better than any of us. We're dead ducks, the lot of us, and the sooner we admit it to ourselves the better."

Allerton didn't reply, but sat staring down at his hands. Several others in the room nodded their heads.

They all agreed with him.

"What's the matter with you all?" Gregg burst out, fear as well as anger sending his voice up in pitch. "You can't just give in like this. There must be something . . ." An idea hit him suddenly. "What about the suit radios? And—and couldn't we circle Earth under power? The flare from the A-drive would certainly be seen, and somebody would want to investigate—"

"But we can't *see* the Earth to circle it," Mercer interrupted harshly. "And there's the radio-activity, remember. We can't hang around until someone gets curious, we'd be dead by that time. I tell you it's hopeless."

Gregg shut up.

It really was hopeless. Gregg admitted that now. Any hopes he had had stemmed solely from his own ignorance of the workings of the ship. The crew were just as anxious to live as he was, but unlike him, they knew when they were beaten.

This was such a *stupid* sort of disaster. Ships had crashed, blown up and sometimes torn themselves apart through uncontrolled acceleration—with the gory demise of all hands. But here nobody—with the exception of Captain Ferguson—had been hurt. No bodies smashed flat by acceleration, or burst open by explosive decompression. All were sound in wind and limb. And all were as good as dead already.

Gregg felt anger growing in him again, rebellious anger. Some

crazy Fate must have ordained that he perish in a space-wreck, and it was going to the most fantastic lengths to make sure he did just that. When he had barely escaped with his life from the old *Allendyne*, he'd sworn that he was through with space-travel. That insane Fate must have gnashed its teeth and frothed at the mouth then—but not for long. If Gregg—either through injury or sheer yellow cowardice, or both—would have nothing further to do with spaceships, then Fate would have to manoeuvre things so that he would *have* to take another trip, so that it could take another crack at him.

And the second time it wouldn't miss.

With great cunning it arranged an understanding medical officer on Mars station, a company representative on the planet itself who was a real nice guy, and a construction job on the new Mars station which was to be hollowed out of the rock of Deimos. That last bit hadn't been hard, because a lot of people were needed for construction. But it had gone to a lot of trouble to see that Gregg made a good showing in his job, and gained rapid promotion. After several occasions when Gregg's—or Fate's—quick thinking saved the company a fair-sized fortune in material when someone miscalculated heights and velocities while moving structural members, he suddenly found himself second-in-charge of the project, and then heading it. He liked the work, he did well at it, and the company liked a man who never seemed to want Earth-leave.

When the new Mars station was completed, Gregg was an important man. So important that other jobs were mentioned. Would Mr. Gregg like to take charge of the proposed new station on Titan? Certainly he would, it was a wonderful opportunity. Would Mr. Gregg then present himself on Earth for a top-level conference on the matter?

Mr. Gregg wouldn't.

But the understanding M.O. and the nice guy who had once been Gregg's boss ganged up on him and told him not to be a fool. He was throwing away the chance of a lifetime over a silly neurosis. Besides, the *Wallaby* was the safest thing in space. Fate rubbed its hands and beamed with glee. It began twisting and stretching the laws of probability to utterly fantastic lengths. This time it wouldn't miss.

And when Gregg ventured out into space again—*smack*!

The eyes of all the crew watching him made Gregg abruptly aware that he was talking to himself, and in a not particularly low undertone. Embarrassed, he wondered how long that had been going on, but Allerton relieved the situation by drawing the attention away from him.

"I suppose," the Second Pilot said, "we should tell the passengers." He sounded doubtful about it.

An argument started about whether or not to tell the passengers, but it was a dispirited thing. Time dragged by, the way it does when there's nothing whatever to do. Like gaol, Gregg thought, or being buried alive, which was a closer simili—buried in a great big complicated coffin that had cost more than a pyramid, with company. It was a great pity about the company, some of them were real nice people.

He thought about the girl with the blue eyes and mussed hair who was still probably mad at him. She didn't deserve this. Or that nice old lady who had spouted higher mathematics at him when he'd expected hysterics . . . Gregg laughed softly in spite of himself.

He had to tell the crew-man beside him what he'd found to laugh about.

"Oh, that's Dr. Townsley," the man explained, "*the* Dr. Townsley. She was Chief Astronomer at Luna Observatory for a while. A mathematical genius, a quiz kid who kept on getting better as she grew up. She's a very nice sort, personally, though."

"You know," Gregg mused, "if we knew our time of collision, our velocity, mass and so on with complete accuracy, we should be able to land by dead reckoning alone—"

"We do not know those things with fair accuracy," the other interrupted. "But it wouldn't work. You're forgetting stratospheric winds—which are completely unpredictable—and the surface of the Earth itself. We'd smash into a mountain top, or come to rest a couple of thousand feet above an ocean." He shook his head. "It's hopeless. What you need to land a ship is constant and accurate information on mass, thrust, air-resistance, velocity, and distance from the surface, and for that," he ended grimly, "you need a full set of landing instruments. We haven't any."

Velocity, mass, distance. Gregg felt himself sweating again. The other's words were repeating themselves over and over inside his head, louder and louder with each repetition. His skull felt as if it would come apart any second with the sheer, thundering volume of those three words. Desperately he willed himself to stop, to go back to the sharing of the crew's despair and quiet resignation. If he didn't do that, Gregg knew, then the idea lying behind those three words would come fully formed to his mind. He didn't want that to happen. *He couldn't go through that again!*

It was a solution or sorts, a way out of this mess for himself and everyone else. But he couldn't tell them about it. He'd bite his tongue out first, he'd . . .

He was two people; Gregg, and somebody else. He was fighting with all the power he had to keep his mouth shut tight. But somebody else with a will just a little stronger than his was forcing it open, and forcing his lips into forming words that he did not want to say :

"I . . . I've got an idea."

Shut up? Gregg screamed silently at that hateful other inhabitant of his mind. Do you want to be stuck in a suit for days on end, with acceleration and your own stink tying your inside into knots? It would *kill* you. I know it, because I've been through it once . . .

But the stupid and suicidal other part of his mind would not shut up. Haltingly, he heard his voice begin to tell the men in the control room about his job on Deimos, and the abilities needed for it. And about the time a temporary structure had collapsed and he'd been able to escape from the slowly falling wreckage through his ability to judge distances and rates of fall of the loose pieces. This was different, of course, but not much.

Gregg tried desperately to choke off those words before it would be too late, but it was no good. He might as well give up the struggle, stop trying. But surprisingly, that decision when it came brought a feeling more of relief than of despair—as if it was what he'd been wanting to do all along. He listened to his own voice expanding on his idea, and even trying to *sell* the idea to the crew-men in the room!

"You," said the man beside him when he'd finished talking, "are mad." But a rising inflexion on the last syllable made it more a question than a statement, and there was a growing brightness in the man's eyes.

Mercer said dazedly: "It might work at that. But are you sure you can do it."

"No," Gregg said, "but is there an alternative?"

There wasn't.

Finally Allerton spoke: "We've no choice but to try it," he said, and he looked peculiarly at Gregg. "But do you know what this means, what you're letting yourself in for?"

"Yes." Gregg knew exactly what he was letting himself in for, stupid fool that he was.

The Second Pilot hesitated. For a moment it looked as if he might say something uncharacteristic—something warm and human that he would probably be ashamed of later. But the hesitation passed :

"In that case there's no time to waste. Peterson, Williamson, Mercer: Get suited up! And somebody dig me out a plan of the ship, quick! We've less than three hours . . ."

There had been disagreement at first whether Gregg or one of the crew should do the job, but that had been settled when Allerton pointed out that any chance they had depended on the crew being at their stations. Then the matter of telling or not telling the passengers came up again. It was decided that they be kept in the dark; it would be kinder that way if the worst should happen. The decisions had been made while Peterson and another man removed a section of hull plating near the stern to make an observation niche, and Mercer ran a communications line from it direct to the control room. Not a second was wasted.

Finally, after the radio-medic had given him an emetic and cautioned him to drink as sparingly as possible, Gregg had been—installed. Three minutes later the ship began deceleration.

The second time wasn't nearly as bad as his memory of the first time had lead him to expect—nothing *could* be as horrible as that, Gregg realised now, because his fear-neurosis had blown that memory up out of all proportion. It was bad enough, though. He had to take two-and-a-half G's for nearly sixty hours, in an upright, standing position. He was sore and stiff and he could feel his blood being forced through each swollen, distended vein in his legs. He wondered if his two-and-a-half times normal weight would cause them to rupture. The thought of bleeding to death from burst varicose veins wasn't pleasant; he tried to forget his legs. Occasionally he managed to sleep, or maybe it was that he simply blacked out. Time was stretched out to its ultimate elastic limit, but it did pass eventually.

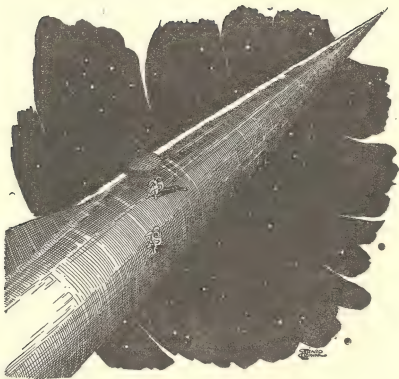
When the ship was less than a planetary diameter out from Earth the A-drive shut down. Gregg ordered several short bursts from the chemical motors to convert their direct approach course into a grazing ellipse, then the gyros nosed the ship over for entry into the atmosphere.

Allerton stammered something then about him being a hero; it made Gregg feel horribly embarrassed. He was, after all, trying to save his own life as well as everyone else's. Peterson, in a bellow that nearly overloaded Gregg's phones, yelled, "Ride 'im, cowboy!" and they slid into air.

Frictional heating began at once. The leading edges of their wings glowed red, then orange, then almost white hot—the vertical stabilisers, too. He could imagine what their anything-but-streamlined hull looked like all too well, though it was outside his angle of vision. The heating would be bad, he knew, because the ship was about as streamlined as a screw-nail. He hoped his suit would stand it.

He said: "Altitude about seventy miles. Speed Mach Five or Six. Heading West Nor'west. New Zealand 'way over on the right."

The ship dipped lower. The air screaming past became a solid



thing that threatened to shake the ship apart. It tore at buckled and weakened plates, peeled them back, and ripped them off. It reached iron-clad fingers of supersonic turbulence into Gregg's observation niche and tried to pluck him out. It tried very hard. But Gregg was lashed—*tightly*—with chains and steel cable to one of the main longerons that ran the length of the ship. He stayed put.

His idea had been simply that he, Gregg, should become the ship's eyes, and he had managed to convince Allerton and the others that there was a good chance of landing the ship by 'talking it' down. He now lay parallel with the long axis of the ship, just above the stern stabilisers. In the *Wallaby's* present position he had a good view

straight down towards the planetary surface, and a reasonably good one sternwards for the coming tail-down landing. If the ship got anywhere near the surface in one piece, that was. In a landing of this type the *Wallaby* operated as a supersonic glider, everything depended on it retaining its aerodynamic stability. But if the collision had warped just one of the flying surfaces out of true, they would be flung into a spin that would pull them apart in seconds—with fatal results, naturally, to all concerned.

Abruptly a more immediate problem forced that thought out of his mind. The plates around his observation niche were glowing red. So were the chains binding him. His suit was getting hotter, and hotter . . .

"The heat will expand—and probably loosen—the chains slightly, but they should hold all right." Allerton's voice was harsh with strain, but he tried to sound reassuring. "It's mostly your imagination about the suit. It will heat up—but it's well insulated and will be livable . . ." the pilot's voice wavered, then went on: ". . . for as long as will be necessary to land the ship. You must have known that, Mr. Gregg."

Gregg grunted. The shoulder piece of his suit—the only part of it that he could see—was turning red. That wasn't imagination. Then it hit him. "*You must have known that, Mr. Gregg!*" Known *what*?

Suddenly, Gregg knew what.

They were crossing the sunrise line. The Indian Ocean below them was a deep blue-green shading almost into purple, and stippled with the bright orange spots of high-flying alto-cumulus. Madagascar was a dun-coloured shadow on the horizon, still lost in the haze of dawn. It was very, very beautiful. Gregg barely noticed it.

So that was the reason for Allerton's peculiar look when Gregg had first told him about this idea, and the Second Pilot's asking him whether he knew exactly what he was doing. It explained why the crew started calling him 'Mr.' as if they really meant it, and their awkwardness towards the end. He'd only *thought* he had known what he was doing. He was a stupid, blind fool. And because of that utter stupidity, he was really going to be a hero.

The posthumous award sort.

If, or when the ship landed, Gregg now knew, his insulated suit would then be nearly as hot inside as it was outside now, and because that insulation was an extremely bad conductor of heat, it would retain that heat long after landing. He would be roasted in his own personal oven long before the crew—opening the airlock, lowering themselves on ropes, and cutting him free—could get him out. But on the other hand, if the shock of landing snapped his heat-weakened fastenings and threw him to the ground, the same thing would happen. If the

impact with hard-baked earth didn't kill him outright, then the rocket's exhaust would fry him to a crisp. Gregg cursed himself silently. He should have kept his big mouth shut and his ideas to himself. He would at least have died comfortably that way; death from radiation poisoning was an easy way to go, he had heard.

Relatively, of course.

A voice crackled suddenly from his phones, startling him.

"We're banking right, I tell you! I feel it. Straighten up! *Straighten up, quick!*"

"Flying straight and level," Gregg contradicted. He added viciously: "I can *see*. You can't."

Allerton's voice sounded, sharply rebuking the offender; then, "Sorry about that, Mr. Gregg."

Gregg understood. The strain of flying a ship with nothing but a voice that *said* the ship was flying level, and going so fast, and with an altitude of such and such, must be killing to men used to the accurate readings of a panel full of instruments. Gregg felt sorry for them.

But he felt sorrier for himself.

Central Africa slid beneath them, then the outline of the West Coast. They were north of the equator now, almost parallelling it. The Atlantic, cloud-covered, was a sea of dirty grey cotton wool; there was no moon. South America passed below, then their glide took them south again into the Pacific.

After one of his periodic height and velocity reports, Gregg said: "We'll have to land next time round—my suit's getting too hot." There must have been something in his voice, Allerton didn't even try to argue.

"Right. Can we make Woomera? Or anywhere in Australia? The passengers—"

"No. Changing direction at this speed would pull our wings off. We want a big flat uninhabited spot. The Sahara looks the best bet, it's right in our line of flight and it should be light enough to—"

An involuntary cry of pain cut the sentence off as a scalding jet of steam erupted into his face. The unused water in his suit's canteen, vaporised by the increasing heat, had blown out the valve of his drinking tube. Eyelids pressed tightly shut and choking on a lung-searing mixture of steam and air, Gregg wondered if he was blind. Then he thought, *what difference did blindness make to him now?* He opened his eyes.

Allerton's voice was a panicky squeaking in his phones, wanting to know what had happened and calling for height and velocity reports.

Gregg coughed a couple of times and was surprised when he found that he could talk.

"But can you *see*?" Allerton asked, his voice harsh with urgency. "Can you see at all?"

"Yes," Gregg lied. He could see all right, but only as far as the face-plate of his helmet. The visor was completely fogged, and the drying chemicals in his helmet—which were meant only to neutralise the water content of his breath—might not be able to handle it.

The Earth below was a grey, featureless shadow that showed neither shape nor distance.

Continuous transonic buffeting threatened to shake the ship to pieces, and Gregg didn't know whether they were heading north, south, or straight down. He sensed changes in direction several times but didn't report them; he had to trust the inherent stability of the ship until he could see again. Gradually the sting went out of his scalded face and for a man who was going to die he didn't feel too badly.

The grey mist on his visor became the grey of clouds whipping past close below him—very close below him. Through gaps he saw ground that wasn't particularly flat, but ahead there seemed to be few if any gaps to see through at all. They'd have to land. Now.

"Height about three miles. Velocity Mach One point Five. Start pulling her up!"

Slowly, heavily, the great ship pointed her nose up in a climb. The climb steepened, became vertical. Speed fell away to nothing as the ship stalled. It began to drop tail first—still held vertical by straining gyros—towards the cloud blanket below.

One gap in the clouds showed a flat, greyish-blue something that could be anything, another the dull brown of sand, and yet another showed a section of jagged and rock-strewn mountain-side. But there were a few houses clinging to that mountain-side; they helped him judge his height and rate of fall with more accuracy than was possible with clouds.

"Thirty-five thousand feet. Fire motors!"

Gregg kept calling altitude figures as the now pink-tinged clouds rushed up at them. But they were falling too fast.

"Increase to six G's for five seconds, then back to three!"

Deceleration jammed him down into his suit, almost bringing his eyes too low for his visor. There really couldn't have been anything wrong with his insides after all, or this sort of treatment would have killed him long ago. But that was small comfort now. One gap in the clouds showed flat, sandy ground, the other a mountain-side that was even more forbidding at close range. The clouds directly below them, he hoped, concealed sand.

At this latitude—if his guess on that was good—cumulus during early morning floated at a height of, let's see . . . Gregg cursed. A low cloud base, practically hugging the ground. No time for corrections after passing through it. Gregg rapidly recited figures. Allerton, because he could do nothing else, treated them as being accurate and worked the ship from them.

In the instant before the clouds engulfed them, a blurr of white that exploded into red on the edge of a stabiliser caught the tail of his eye, and for one wild second he felt almost hopeful. Then they hit and a mighty blow tore him free of the chains and flung him into a seething white cauldron that went down for ever. Frantically he kicked out with his feet and forced his cracking arm muscles to aid them in impelling him away from the twisted wreckage of his observation post. About twenty feet away from the *Wallaby's* hull the water was actually cool. Gregg turned over and relaxed, floating slowly upward in the cool, green ocean. He still felt like a half-boiled lobster, but he hadn't any doubt at all that he was going to live. He looked around.

The ship was at rest on the sandy bottom of what looked like a shallow bay somewhere in Morocco. All but thirty feet of her was submerged and the outraged denizens of the sea were fleeing from the bubbles made as the high hull temperature transferred itself to the surrounding water. The cargo hatch, which was below water level, opened and two figures clad in space suits stared downwards. At the sight of Gregg floating slowly towards the surface one raised an arm in greeting—or perhaps in silent farewell, thinking him dead. But he had no intention of dying now. He raised one arm in acknowledgment.

As he broke surface and floated on his back, the tiny waves washing over his cooling suit and rocking him gently in their embrace, he saw a naval cutter flying the tricolour of France come forging round the rocky, cloud-wrapped headland he had mistaken for a mountain. There must be a seaport nearby, he thought. That would be handy; the day after to-morrow he had to see a man about a job, on Titan.

James White

John Wyndham's short stories are as celebrated as his numerous novels and the following is no exception. Departing from his favourite theme of the complexities involved in Time travel he has devised a forceful story concerning a robot maid-servant.

COMPASSION CIRCUIT

By John Wyndham

By the time Janet had been five days in hospital she had become converted to the idea of a domestic robot. It had taken her two days to discover that Nurse James *was* a robot, one day to get over the surprise, and two more to realise what a comfort an attendant robot could be.

The conversion was a relief. Practically every house she visited had a domestic robot; it was the family's second or third most valuable possession—the women tended to rate it slightly higher than the car; the men, slightly lower. Janet had been perfectly well aware for some time that her friends regarded her as a nitwit or worse for wearing herself out with looking after a house which a robot would be able to keep spick and span with a few hours work a day. She had also known that it irritated George to come home each evening to a wife who had tired herself out by unnecessary work. But the prejudice had been firmly set. It was not the diehard attitude of people who refused to be served by robot waiters, or driven by robot drivers (who, incidentally, were much safer), led by robot shop-guides, or see dresses modelled by robot mannequins. It was simply an uneasiness about them, and being left alone with one—and a disinclination to feel such an uneasiness in her own home.

She herself attributed the feeling largely to the conservatism of her own home which had used no house-robots. Other people, who had been brought up in homes run by robots, even the primitive types available a generation before, never seemed to have such a feeling at all. It irritated her to know that her husband thought she was *afraid* of them in a childish way. That, she had explained to George a number of times, was not so, and was not the point, either: what she did dislike was the idea of one intruding upon her personal, domestic life, which was what a house-robot was bound to do.

The robot who was called Nurse James was, then, the first with which she had ever been in close personal contact and she, or it, came as a revelation.

Janet told the doctor of her enlightenment, and he looked relieved. She also told George when he looked in in the afternoon, he was delighted. The two of them conferred before he left the hospital. "Excellent," said the doctor. "To tell you the truth I was afraid we were up against a real neurosis there—and very inconveniently, too. Your wife can never have been strong, and in the last few years she's worn herself out running the house."

"I know," George agreed. "I tried hard to persuade her during the first two years we were married, but it only led to trouble so I had to drop it. This is really a culmination—she was rather shaken when she found that the reason she'd have to come here was partly because there was no robot at home to look after her."

"Well, there's one thing certain, she can't go on as she has been doing. If she tries to she'll be back here inside a couple of months," the doctor told him.

"She won't now. She's really changed her mind," George assured him. "Part of the trouble was that she's never come across a really modern one except in a superficial way. The newest that any of our friends has is ten year old at least, and most of them are older than that. She'd never contemplated the idea of anything as advanced as Nurse James. The question now is what pattern?"

The doctor thought a moment.

"Frankly, Mr. Shand, your wife is going to need a lot of rest and looking after, I'm afraid. What I'd really recommend for her is the type they have here. It's something pretty new, this Nurse James model. A specially developed high-sensibility job with a quite novel contra-balanced compassion-protection circuit—a very tricky bit of work, that—any direct order which a normal robot would obey at once is evaluated by the circuit, it is weighed against the benefit or harm to the patient, and unless it is beneficial, or at least harmless, to the patient, it is not obeyed. They've proved to be wonderful for nursing

and looking after children—but there is a big demand for them, and I'm afraid they're pretty expensive."

"How much?" asked George.

The doctor's round-figure price made him frown for a moment. Then he said:

"It'll make a hole, but, after all, it's mostly Janet's economies and simple-living that's built up the savings. Where do I get one?"

"You don't. Not just like that," the doctor told him. "I shall have to throw a bit of weight about for a priority, but in the circumstances I shall get it, all right. Now, you go and fix up the details of appearance and so on with your wife. Let me know how she wants it, and I'll get busy."

"A proper one," said Janet. "One that'll look right in a house, I mean. I couldn't do with one of those levers-and-plastic box things that stare at you with lenses. As it's got to look after the house, let's have it looking like a housemaid."

"Or a houseman, if you like?"

She shook her head. "No. It's going to have to look after me, too, so I think I'd rather it was a housemaid. It can have a black silk dress and a frilly white apron and a cap. And I'd like it blonde—a sort of darkish blonde—and about five feet ten, and nice to look at, but not too beautiful. I don't want to be jealous of it . . ."

The doctor kept Janet ten days more in the hospital while the matter was settled. There had been luck in coming in for a cancelled order, but inevitably some delay while it was adapted to Janet's specification—also it had required the addition of standard domestic pseudo-memory patterns to suit it for housework.

It was delivered the day after she got back. Two severely functional robots carried the case up the front path, and inquired whether they should unpack it. Janet thought not, and told them to leave it in the outhouse.

When George got back he wanted to open it at once, but Janet shook her head.

"Supper first," she decided. "A robot doesn't mind waiting."

Nevertheless it was a brief meal. When it was over George carried the dishes out and stacked them in the sink.

"No more washing-up," he said, with satisfaction.

He went out to borrow the next-door robot to help him carry the case in. Then he found his end of it more than he could lift, and had to borrow the robot from the house opposite, too. Presently the pair of them carried it in and laid it on the kitchen floor as if it were a feather-weight, and went away again.

George got out the screwdriver and drew the six large screws that held the lid down. Inside there was a mass of shavings. He shoved them out, on to the floor.

Janet protested.

"What's the matter? *We* shan't have to clear up," he said, happily.

There was an inner case of wood-pulp, with a snowy layer of wadding under its lid. George rolled it up and pushed it out of the way, and there, ready dressed in black frock and white apron, lay the robot.

They regarded it for some seconds without speaking.

It was remarkably lifelike. For some reason it made Janet feel a little queer to realise that it was *her* robot—a trifle nervous, and, obscurely, a trifle guilty . . .

"Sleeping beauty," remarked George, reaching for the instruction-book on its chest.

In point of fact the robot was not a beauty. Janet's preference had been observed. It was pleasant and nice-looking without being striking, but the details were good. The deep gold hair was quite enviable—although one knew that it was probably threads of plastic with waves that would never come out. The skin—another kind of plastic covering the carefully built-up contours—was distinguishable from real skin only by its perfection.

Janet knelt down beside the box, and ventured a forefinger to touch the flawless complexion. It was quite, quite cold.

She sat back on her heels, looking at it. Just a big doll, she told herself; a contraption, a very wonderful contraption of metal, plastics, and electronic circuits, but still a contraption, and made to look as it did simply because people, including herself, would find it harsh or grotesque if it should look any other way . . . And yet, to have it looking as it did was a bit disturbing, too. For one thing, you couldn't go on thinking of it as 'it' any more; whether you liked it or not, your mind thought of it as 'her.' As 'her' it would have to have a name; and, with a name, it would become still more of a person.

"A battery-driven model," George read out, "will normally require to be fitted with a new battery every four days. Other models, however, are designed to conduct their own re-generation from the mains as and when necessary." Let's have her out."

He put his hands under the robot's shoulders, and tried to lift it.

"Phew!" he said. "Must be about three times my weight." He had another try. "Hell," he said, and referred to the book again.

"The control switches are situated at the back, slightly above the waistline.' All right, maybe we can roll her over."

With an effort he succeeded in getting the figure on to its side and began to undo the buttons at the back of her dress. Janet suddenly felt that to be an indelicacy.

"I'll do it," she said.

Her husband glanced at her.

"All right. It's yours," he told her.

"She can't be just 'it.' I'm going to call her Hester."

"All right, again," he agreed.

Janet undid the buttons and fumbled about inside the dress.

"I can't find a knob, or anything," she said.

"Apparently there's a small panel that opens," he told her.

"Oh, no!" she said, in a slightly shocked tone.

He regarded her again.

"Darling, she's just a robot; a mechanism."

"I know," said Janet, shortly. She felt about again, discovered the panel, and opened it.

"You give the upper knob a half-turn to the right and then close the panel to complete the circuit," instructed George, from the book.

Janet did so, and then sat swiftly back on her heels again, watching.

The robot stirred and turned. It sat up, then it got to its feet. It stood before them, looking the very pattern of a stage parlourmaid.

"Good day, madam," it said. "Good day, sir. I shall be happy to serve you."

"Thank you, Hester," Janet said, as she leaned back against the cushion placed behind her. Not that it was necessary to thank a robot, but she had a theory that if you did not practice politeness with robots you soon forgot it with other people.

And, anyway, Hester was no ordinary robot. She was not even dressed as a parlourmaid any more. In four months she had become a friend, a tireless, attentive friend. From the first Janet had found it difficult to believe that she was only a mechanism, and as the days passed she had become more and more of a person. The fact that she consumed electricity instead of food came to seem little more than a foible. The time she couldn't stop walking in a circle, and the other time when something went wrong with her vision so that she did everything a foot to the right of where she ought to have been doing it, these things were just indispositions such as anyone might have, and the robot-mechanic who came to adjust her paid his call much like any other doctor. Hester was not only a person; she was preferable company to many.

"I suppose," said Janet, settling back in her chair, "that you must think me a poor, weak thing?"

A thing one must not expect from Hester was euphemism.

"Yes," she said, directly. But then she added: "I think all humans are poor, weak things. It is the way they are made. One must be sorry for them."

Janet had long ago given up thinking things like: "That'll be the compassion-circuit speaking," or trying to imagine the computing, selecting, associating, and shunting that must be going on to produce such a remark. She took it as she might from—well, say, a foreigner. She said:

"Compared with robots we must seem so, I suppose. You are so strong and untiring, Hester. If you knew how I envy you that . . ."

Hester said, matter of factly:

"We were designed: you were just accidental. It is your misfortune, not your fault."

"You'd rather be you than me?" asked Janet.

"Certainly," Hester told her. "We are stronger. We don't have to have frequent sleep to recuperate. We don't have to carry an unreliable chemical factory inside us. We don't have to grow old and deteriorate. Human beings are so clumsy and fragile and so often unwell because something is not working properly. If anything goes wrong with us, or is broken, it doesn't hurt and is easily replaced. And you have all kinds of words like pain, and suffering, and unhappiness, and weariness that we have to be taught to understand, and they don't seem to us to be useful things to have. I feel very sorry that you must have these things and be so uncertain and so fragile. It disturbs my compassion-circuit."

"Uncertain and fragile," Janet repeated. "Yes, that's how I feel."

"Humans have to live so precariously," Hester went on. "If my arm or leg should be crushed I can have a new one in a few minutes, but a human would have agony for a long time, and not even a new limb at the end of it—just a faulty one, if he is lucky. That isn't as bad as it used to be because in designing us you learned how to make good arms and legs, much stronger and better than the old ones. People would be much more sensible to have a weak arm or leg replaced at once, but they don't seem to want to if they can possibly keep the old ones."

"You mean they can be grafted on? I didn't know that," Janet said. "I wish it were only arms or legs that's wrong with me. I don't think I should hesitate . . ." She sighed. "The doctor wasn't encouraging this morning, Hester. You heard what he said? I've been losing ground: must rest more. I don't believe he does expect me to get any stronger. He was just trying to cheer me up before . . . He had a funny sort of look after he'd examined me . . . But all he said was rest. What's the good of being alive if it's only rest—rest—rest? . . . And there's poor George. What sort of a life is it for him, and he's so patient with me, so sweet . . . I'd rather anything than go on feebly like this. I'd sooner die . . ."

Janet went on talking, more to herself than to the patient Hester standing by. She talked herself into tears. Then, presently, she looked up.

"Oh, Hester, if you were human I couldn't bear it; I think I'd hate you for being so strong and so well—but I don't Hester. You're so kind and so patient when I'm silly, like this. I believe you'd cry with me to keep me company if you could."

"I would if I could," the robot agreed. "My compassion-circuit—"

"Oh, *no*!" Janet protested. "It can't be just that. You've a heart somewhere, Hester. You must have."

"I expect it is more reliable than a heart," said Hester.

She stepped a little closer, stooped down, and lifted Janet up as if she weighed nothing at all.

"You've tired yourself out, Janet, dear," she told her. "I'll take you upstairs; you'll be able to sleep a little before he gets back."

Janet could feel the robot's arms cold through her dress, but the coldness did not trouble her any more, she was aware only that they were strong, protecting arms around her. She said:

"Oh, Hester, you are such a comfort, you *know* what I ought to do." She paused, then she added miserably: "I know what he thinks—the doctor, I mean. I could see it. He just thinks I'm going to go on getting weaker and weaker until one day I'll fade away and die . . . I said I'd sooner die . . . but I wouldn't Hester. I don't want to die . . ."

The robot rocked her a little, as if she were a child.

"There, there, dear. It's not as bad as that—nothing like," she told her. "You mustn't think about dying. And you mustn't cry any more, it's not good for you, you know. Besides, you won't want him to see you've been crying."

"I'll try not to," agreed Janet obediently, as Hester carried her out of the room and up the stairs.

The hospital reception-robot looked up from the desk.

"My wife," George said. "I rang you up about an hour ago."

The robot's face took on an impeccable expression of professional sympathy.

"Yes, Mr. Shand. I'm afraid it has been a shock for you, but as I told you, your house-robot did quite the right thing to send her here at once."

"I've tried to get on to her own doctor, but he's away," George told her.

"You don't need to worry about that, Mr. Shand. She has been examined, and we have had all her records sent over from the hospital

she was in before. The operation has been provisionally fixed for tomorrow, but of course we shall need your consent."

George hesitated. "May I see the doctor in charge of her?"

"He isn't in the hospital at the moment, I'm afraid."

"Is it—absolutely necessary?" George asked, after a pause.

The robot looked at him steadily, and nodded.

"She must have been growing steadily weaker for some months now," she said.

George nodded.

"The only alternative is that she will grow weaker still, and have more pain before the end," she told him.

George stared at the wall blankly for some seconds.

"I see," he said bleakly.

He picked up a pen in a shaky hand and signed the form that she put before him. He gazed at it awhile without seeing it.

"She—she'll have—a good chance?" he asked.

"Yes," the robot told him. "There is never complete absence of risk, of course, but she has a better than seventy-per-cent likelihood of complete success."

George sighed, and nodded.

"I'd like to see her," he said.

The robot pressed a bell-push.

"You may see her," she said. "But I must ask you not to disturb her. She's asleep now, and it's better for her not to be woken."

George had to be satisfied with that, but he left the hospital feeling a little better for the sight of the quiet smile on Janet's lips as she slept.

The hospital called him at the office the following afternoon. They were reassuring. The operation appeared to have been a complete success. Everyone was quite confident of the outcome. There was no need to worry. The doctors were perfectly satisfied. No, it would not be wise to allow any visitors for a few days yet. But there was nothing to worry about. Nothing at all.

George rang up each day just before he left, in the hope that he would be allowed a visit. The hospital was kindly and heartening, but adamant about visits. And then, on the fifth day, they suddenly told him she had already left on her way home. George was staggered: he had been prepared to find it a matter of weeks. He dashed out, bought a bunch of roses, and left half-a-dozen traffic regulations in fragments behind him.

"Where is she?" he demanded of Hester as she opened the door.

"She's in bed. I thought it might be better if—" Hester began, but he lost the rest of the sentence as he bounded up the stairs.

Janet was lying in the bed. Only her head was visible, cut off by the line of the sheet and a bandage round her neck. George put the flowers down on the bedside table. He stooped over Janet and kissed her gently. She looked up at him from anxious eyes.

"Oh, George dear. Has she told you?"

"Has who told me what?" he asked, sitting down on the side of the bed.

"Hester. She said she would. Oh, George, I didn't mean it at least, I don't think I meant it . . . She sent me, George. I was so weak and wretched. I wanted to be strong. I don't think I really understood. Hester said—"

"Take it easy, darling. Take it easy," George suggested with a smile. "What on earth's all this about?"

He felt under the bedclothes and found her hand.

"But, George—" she began. He interrupted her.

"I say, darling, your hand's dreadfully cold. It's almost like—" His fingers slid further up her arm. His eyes widened at her, incredulously. He jumped up suddenly from the bed and flung back the covers. He put his hand on the thin nightdress, over her heart—and then snatched it away as if he had been stung.

"God! —NO! —" he said, staring at her.

"But George. George, darling—" said Janet's head on the pillows.

"NO! —NO!" cried George, almost in a shriek.

He turned and ran blindly from the room.

In the darkness on the landing he missed the top step of the stairs, and went headlong down the whole flight.

Hester found him lying in a huddle in the hall. She bent down and gently explored the damage. The extent of it, and the fragility of the frame that had suffered it disturbed her compassion-circuit very greatly. She did not try to move him, but went to the telephone and dialled.

"Emergency?" she asked, and gave the name and address. "Yes, at once," she told them. "There may not be a lot of time. Several compound fractures, and I think his back is broken, poor man. No. There appears to be no damage to his head. Yes, much better. He'd be crippled for life, even if he did get over it. —Yes, better send the form of consent with the ambulance so that it can be signed at once.— Oh, yes, that'll be quite all right. His wife will sign it."

John Wyndham

Radio astronomy has opened vast possibilities for increasing the sum of Man's knowledge outside the range of the most powerful telescopes we can operate within the Earth's air envelope. This month's article brings up-to-date information about this little-known science.

INVISIBLE ASTRONOMY

By John Newman

From outer space, even from beyond the limits of our galaxy, come radio waves that, like ceaseless surf from the oceans of the void, beat down on the surface of our planet. Some are absorbed and reflected by our atmosphere but the remainder forms the cosmic noise, the background of static that can be heard on any radio. The fact that these signals are extra-terrestrial was discovered as far back as 1931 but little attention was paid to them until the end of World War II, when the newly developed techniques and apparatus of radar were applied to more peaceful studies.

Little has been heard of the successes of the new science known as radio astronomy, although the news of radar astronomy hit the headlines when the U.S. Signal Corps bounced radar signals from the moon and when radar was used to count the number of meteors entering our atmosphere. Radio astronomy utilizes new methods to analyse the radio waves from space and has already been used to discover the true shape of our galaxy, to map the clouds of interstellar gas and to discover galaxies beyond the range of the 200 inch telescope on Mount Palomar.

Soon after these extra-terrestrial radio waves were discovered, their directions and concentrations were measured and it was found that they were mainly coming from the Milky Way, the band of stars across the sky that makes up our galaxy. The waves were concentrated in the directions of greatest star density but, curiously enough, none of the brighter stars seemed to be emitting any radio waves.

Research was stopped during the war but, in 1942, radar units were completely upset by a great burst of radio waves from the sun that

interfered with reception for three days. There were other reports of solar radio waves in the radar band and, when the war ended, these led to an intensive study of the radio waves emitted by the sun as well as from other sources.

Radio waves are part of the electromagnetic spectrum that also includes infra-red, visible, ultraviolet, X-rays and gamma waves. All these have the same speed and can pass unhindered through a vacuum, their differences being due to variations in the wavelength of the waves. Our knowledge of the universe comes from astronomical research carried out with telescopes, these being receivers of radiation in a narrow band including the visible range. They are confined to this band because of the limitations of the eye and of panchromatic photographic plates, as well as the fact that the atmosphere is opaque to most ultraviolet light. Some astronomical research work has been carried out by sending up high altitude rockets fitted with telescopes and cameras to photograph the sun from well above the greater part of the atmosphere. It is an expensive and tedious method and this is one of the fields that would greatly benefit by the establishment of an observatory in a space station or on the moon.

It has not mattered much that, until now, we have only been able to examine the visible radiation from stars; most stars are hot enough to broadcast the greater part of their energy and their most informative spectral lines in this range. Giant telescopes such as the 100 inch on Mount Wilson and the 200 inch have enabled us to study the hot stars with great success but these large telescopes are mainly concentrated in the United States. This is because they require outstanding good weather conditions for viewing and there are only a few places in the world that are suitable. Telescopes can help little with problems where there is little emitted light due to obscuring dust, low temperatures or great distance.

Radio telescopes can be operated in practically any country, for short radio waves are unaffected by clouds, fog and rain, this making them particularly useful in Great Britain. Nor are the waves hindered by the interstellar dust clouds that prevent light from a large part of our galaxy from reaching us—radio telescopes can give us much new information about the mechanics and construction of the universe that normal telescopes deny us.

Going down the electromagnetic spectrum we pass from longer to shorter wavelengths. At the longest end are the long and medium wavelengths normally used for radio communication; most of the B.B.C. programmes are in these ranges. Below these are the short wave communication bands that extend down to a wavelength of about

10 metres. They can pass through ordinary air but are reflected by a layer of ionised air high above the Earth, this being known as the ionospheric layer. The ionospheric layer also reflects short wave radio waves from outside the Earth, so that the upper part of the atmosphere is opaque as far as this waveband is concerned.

Radar waves, the ones used are in a range down to about 10 centimetres, can easily pass through air and through the ionised layer. It was these that the U.S. Signal Corps reflected from the moon. With powerful transmitters and tightly beamed signals it should be possible to do this with the nearer planets, particularly if the transmitters and receivers can be stationed above the Earth's atmosphere.

Well below the short wave band is the infra-red band, with waves of a few thousandths of a millimetre, much of it being absorbed by water vapour in the air. Between the short wave and infra-red bands lies the range of wavelengths that are now being used in radio astronomy. They can be thought of as either ultra-short short waves or extra-long infra-red waves that can pass unhindered through air, ionised gases and water vapour.

There is one big drawback to their use that the ingenuity of radio astronomers is now overcoming—the longer the wavelength the greater the size of reflector necessary to obtain good resolving power, the ability to distinguish between two objects fairly close to one another. The University of Manchester is now building a giant radio telescope at Jodrell Bank in Cheshire with a steel reflector bowl 250 feet in diameter. It will weigh 300 tons and, running on a circular track, will be completely steerable to point at any position in the sky and track it automatically. It will be the largest in the world, but even so, it will only be able to give good resolution with radiowaves with wavelengths less than 1 centimetre.

Ingenious methods have been developed to get around the difficulty of using longer wavelengths but to still get good resolution. These include two arrays of aerials in the form of a cross so connected that they can be alternately switched in and out of phase, two widely separated aerials or one aerial on a cliff overlooking the sea so that the interference between the waves from space and the radio waves reflected by the water can be measured. The resolving power of two aerials is equivalent to a telescope with an aperture twice the distance between them and that of an aerial on a cliff is equivalent to an aperture four times the height of the cliff.

When these types of radio telescopes were built after the war, it was discovered that there were two types of radio waves broadcast by the sun. One type is present all the time and is weak, being that given

out by any hot body. But, occasionally, there are large outbursts of radio radiation caused by sunspots and solar flares from the surface of the sun. Solar flares are great jets of gas spurting outwards that create bursts of radio waves of about 1 metre wavelength for periods ranging from a few seconds to several days. They are also connected with radio fade-outs caused by the particles they eject hitting our atmosphere and altering the reflecting layer.

From the characteristics of the radio waves from sunspots and solar flares, analysis of harmonics and so on, it was found that they were not caused by random collisions of charged particles in the sun's atmosphere but by the movement of individual electrons in the magnetic fields of sunspots and by the large movements of clouds of electrons shooting out from the sun at about 500 miles a second. But the sun is not an intense emitter of radio waves; using generators on a single wavelength we can quite easily produce a thousand times the total output of the sun.

When radio astronomers turned their attention further afield and examined the radio waves from beyond the solar system they found that the position was far more complex. They found a general background of radio waves, the cosmic noise, whose intensity was directly related to the concentration of stars in our galaxy, but they were unable to detect radiation from any single star, even the bright near ones. They came to the conclusion that the waves come not from the stars themselves but from material similarly scattered in space, the great clouds of interstellar dust.

But, also, superimposed on this background radiation, they found a large number of intense localised sources of radio waves—over 200 have so far been discovered. Astronomers were unable to correlate these sources with particular types of stars and, at first, it was thought that a new type of astronomical body had been discovered. These bodies were considered to be stars with too low a temperature to be visible but were powerful emitters of radio waves, being of frequent occurrence and widely distributed throughout this galaxy. They were called radio stars but it was later shown that they are not stars; a better name for them is radio sources.

Because the resolving power of radio telescopes is not yet equal to ordinary telescopes, it is impossible to exactly pinpoint the position of a radio source, only to indicate its approximate position in the sky. The angle indicated may contain thousands of stars and galaxies and it was this uncertainty that was at first responsible for the difficulty in identifying the radio sources.

The three most intense radio sources occur in the Constellations of Taurus, Cygnus and Cassiopeia and all have recently been identified and correlated with visible astronomical bodies. The first radio source

to be identified was the one in Taurus; it was found to be in the same position and of the same shape as the Crab nebula, the great cloud of glowing gas that is the remains of a supernova explosion that, in A.D. 1054, blew most of the central star into gas. This rapidly expanding shell of gas contains many fast moving streamers of gas, filaments with complex internal movements that pass through one another. This was confirmed when another radio source was found at the point where Tycho Brahe's supernova occurred in 1572, although there are now no visible remains of it. Although this showed that some radio sources could be correlated with the remnants of supernova, it was not a general explanation for the large number of observed radio sources; only a very few supernovae are created in this galaxy, something like one every three hundred years.

It was not long before the radio sources in Cygnus and Cassiopeia were accurately mapped using aerials five miles apart and they were identified by W. Baade and R. Minkowski using the 200 inch telescope. They photographed the two positions and, in each case, located peculiar structures and were able to obtain their spectra. The radio source in the constellation of Cygnus is the scene of a collision between two galaxies, just over a 100 million light years away from us. Bright lines in the spectrum show that, as the two great clouds of stars intermesh, their interstellar dust and gas clouds stream through one another at high speed and are mutually excited and ionised. The positions of two other colliding galaxies have already been identified as radio sources.

The strongest radio source of all, the one in Cassiopeia, was found to be in our galaxy and is a diffuse, glowing cloud of gas containing randomly streaming filaments moving at about 1,600 miles a second. A similar cloud was also found in the same position as a radio source in the constellation of Puppis.

Seven of the weaker radio sources were found to be ordinary galaxies, such as the Andromeda galaxy, similar to our own. Their emissions are faint but similar to the total amount that our galaxy emits. Whilst many of the other radio sources have to be identified it is thought that quite a number of them are galaxies beyond the limits of our ordinary telescopes—already this young science has in one way outstripped conventional astronomy, one of the oldest sciences.

Although none have yet been discovered, it is possible that radio stars do exist; they would have to be cool, non-luminous objects such as, say, a black dwarf star.

All these radio sources have one thing in common, they contain clouds and filaments of ionised gas in rapid motion, but the actual

mechanism of their formation of radio waves is not yet clear. It is probable that the background of cosmic noise from the interstellar gas in this galaxy is due to the high speed ionised atoms of gas being forced into spiral paths by the magnetic field of the galaxy. It is known that light is emitted by ions moving in intense magnetic fields in accelerator machines and it is probable that radio waves would be formed in less intense magnetic fields.

One particular radio wave, the one with a wavelength of 21 centimetres, is emitted by hydrogen gas and has been distinguished in the emission from the interstellar gas in our galaxy and in the Magellanic Clouds, but not from the sun. This particular wavelength is being used to study the structure of galaxies and the distance of radio sources, for it is not obscured by dust but can be absorbed as well as emitted by hydrogen gas. By making assumptions about the temperature and movements of our galaxy, from visual data, it is possible to find the distance and density of the hydrogen clouds and construct a contour map. This shows that our galaxy has a spiral structure with trailing arms. This method also shows that the Magellanic Clouds contain little hydrogen near their centres but that the hydrogen clouds extend outwards beyond the limits of the stars at the edge. It also gives a detailed picture of the speeds of the different parts of the Magellanic Clouds. Attempts are now being made to measure the shift towards the 'red' in the 21 centimetre line from very distant galaxies. This would enable their distances and velocities away from us to be calculated.

If we could see by means of radio instead of light waves the universe would indeed seem strange to us. The Sun would appear larger than when seen by visible light and would be brighter at the edge than near the centre, due to the larger amounts of radio waves coming from the sun's atmosphere. It wouldn't even appear circular in shape, the radio sun would seem elliptical with its greatest diameter along the equator.

Not one of the usual stars would be visible, although clouds and mist would be completely transparent and the sky would always be visible. A broad band of diffuse light across the sky would mark the position of gas and dust in the Milky Way and, apparently dotted at random across the heavens, there would be a few hundred bright spots, the radio sources. With no stars or planets visible, astronomy would be one of the least developed sciences and a highly developed technology would have to be reached before instruments could be built to discover them.

John Newman

The Ferry Service from Penutus to Earth was something Incomprehensible, for while the ship took three years at a speed faster-than-light to make the journey, over 1,000 years of normal Time had passed on Earth. Many things changed in that time, as ferrymen and mem found out upon landing. Not the least being civilisations.

FERRYMAN

By Richard Rowland

Illustrated by OSBORNE

"You realise this thing is bigger than both of us?" the tall thin man had said, and she had nodded, feeling an almost hysterical urge to giggle. Instead she had looked past him, seeing the smooth lawns beyond the transparent crystal walls.

The memory picture, thought Tuanie Reed, was quite astonishingly vivid, and the dust-dry tones of the chairman might have ceased only a minute since instead of all that time ago. She remembered how proud she had felt, standing there in the low room before the Final Interview Board. Young and proud and elated all in one; wearing, for the first time, the trim white uniform of the Service.

The chairman's outflung arms had embraced the rest of the Board dramatically. "We shall not be here when you return. Nobody you know, relations, friends, acquaintances . . ." His voice had dropped an octave, "will then remain. Even the city itself may not be here. The Ferry Service has no parallel in all history. It is unique."

The second member of the Board had said bluntly, "Your five years of training, by a long way the stiffest course we have, should have shown you that Service flyers are more on their own, literally, than any other human beings. That is a tremendous test, especially for a man. You will find when you reach the end of a run, an almost irresistible desire to put down roots; to live a normal life." Not so long for that now, Tuanie thought. One more run, the last home run, and she would be free and 45: just entering the prime of life with an expectation, by all reasonable standards, of another 90 or more full years.

Then the chairman again. "As you know, your span of duty in terms of time to you, will extend over 20 years—including 12 months leave at the end of each run—before you retire on pension, which, I may say, is a very handsome one." It was, too.

The third member of the Board had opened his old eyes. "And that, my dear young mam, provided you meet with no catastrophe, will be some 6,000 years hence in time according to P." His eyes had brightened with an approving and an appreciative twinkle. "And if your conduct is even half as good as your looks you will be a credit to the Service."

The chairman had pushed forward the blood sheets, making a little ceremony of it, and Tuanie had signed for six runs, three in each direction, between Penutus and Earth.

Tuanie sighed. Ah, well! memories were alright but there was work to be done. She stood up from the couch and, for the third time in five minutes, checked the auto panel. Zone 3 deceleration must have auto'd in by now! But it hadn't. Perhaps, she thought, there was a fault in Outer Control; or maybe no control at all. Not that that need necessarily be fatal but it might mean disappointment. After all this time, she had a pent-up urge to meet people; to talk and laugh and to walk more than a dozen steps in one direction: to see further than the smoothly curving walls with their false windows.

It occurred to her that Frankland itself might not exist any more. After all, around 2,000 years had passed since she had last been to Earth.

She shrugged the thought away and crossed to the mirror, a habit of hers when morale threatened to sink. It was easy enough on a trip like this to let appearances slip, but she approved what she saw. The daily sunlamp session had given her skin a glowing tan that set off the auburn of her hair; the stain on her lips was as fresh as the minute and her brown eyes were clear. Those exercises might be a bore but they had kept her figure slim and supple. "You're alright, Tuanie," she said aloud. "Not doing too badly at all."



Behind her the voice spoke on and for a while she listened. "... for thousands of years the ships of the Ferry Service have arched through space, linking the civilisations of built-up planets circling remote suns with the one that sired them—that of Earth." He had a pleasant voice, she thought, something dynamic about it. For the hundredth time she wondered what he had looked like.

The voice went on, filling the small cabin. "Over these immense distances the Ferry ships are the sole regular means of contact. The time element is such that few others make the journey. Occasionally a big ship lifts from Earth with emigrants for one planetary system or another but, on the whole, only the Ferry Service ventures across the light years that separate out-space from what we still refer to as The Solar System."

Tuanie returned to the couch, fixing the stimulators and plugging them into power. She kept the voice on for company and because it gave her that sense of 'belonging' so easily lost in deep space. She had not needed it at the start of the trip: taking over a new ship had made a deal of difference. She had pottered about for the first few weeks, taking her time, stretching out for as long as possible the process of getting to know him—Tuanie could never bring herself to call a ship 'she' as did the ferrymen—and she had soon decided that *Bart 4ME*, latest of a long line of supercraft, was a poppet.

She listened again to the voice. "It was in Earth year 2099 that an emigrant fleet of seven ships lifted from Earth; destination uncertain. In Earth year 2600, the ships reached Penutus—so called from the combined initials of the ships' captains . . ."

Tuanie wondered again why they had not called it Stupenu or Unupets. She rather fancied Unupets. "Penutus, of Earth type, orbits Marn, a yellow dwarf star, at 160,003,208 Kms. out. Its year is 364 Earth days. To those who flew in the emigrant ships the elapsed time totalled no more than eight years." Things were different now, she thought. *Bart 4ME* could do the double trip in something under five.

The voice droned on, keeping loneliness at bay. "They called the year of their arrival P1. In the year P150, the Central Council decided that communication with the planet of their ancestors was desirable, even though they themselves would not live to hear the results for, in spite of all research, it has still been found impossible to establish radio communications between systems. Accordingly, the first Ferry Service ship left Penutus for Earth in P152, using what we now refer to as the Series 1 Reed Drive." Tuanie got her usual kick from that.

"Along with the news of the discovery of Penutus and the history of our first 150 years, went the suggestion that a regular service be instituted between Penutus and Earth. That first ship, the *Wanda 4ME*, reached Earth 800 years later, in P952, corresponding to Earth's 3552, the 36th century AD. To the flyer, of course, the time taken was a little under four years.

"Our suggestions were adopted and the Service inaugurated. Now, owing to the higher speeds achieved, the time-lapse for each one-way trip is of the order of 1000 years. For the flyer it approximates three. Therefore, the news brought by each ship is necessarily 1000 years out of date but that is the best possible: there is no other method."

Tuanie thought of the small machine and the packet of microfilm in the hold. A new method and the end of a magnificent Service. It seemed ironic to her that so lovely a vessel should be carrying the thing that would make the Service obsolete. Not that it affected her; the return to Penutus would be her last trip anyway.

The narrator was saying, "it will be understood . . ." Tuanie switched him off and flicked the view-changer to alter the projected pictures in the imitation portholes. On one side the familiar purple trees and blue grasses of the Penutus landscape passed swiftly as though seen from a few hundred metres up. On the other the milky blue Penutus sea broke gently and endlessly on the fine red sand.

On the auto panel welcome lights flashed as Zone 3 finally connected. Tuanie gave a whoop of delight. Two more zones and then Inner. It wouldn't be long now. She pressed a button and spoke the log up to date.

Tuanie watched the light responses dance on the control panel—now swung to its horizontal position; listened to the faint metallic click of the relays as Inner Earth Control took over, and breathed a sigh of relief. She had never been able to get rid of the thought that one of these years, even though the outer controls were there, she might meet a landing beam which did not link with the ship's equipment—which would make it rather late for decisions. And that, she thought, as she slipped the regulation LP between her lips, was the least of the hazards they had told her about in the dim past when she had been accepted for the job.

As she passed into the semi-dream state—"Plexus Landing Pills guarantee no nightmares"—she wondered what Frankland would be like this time. How good it was going to be to see people again.

Triggered from Control Tower, the tiny needle concealed in the strap encircling her wrist lanced into the bloodstream and returned

her to full consciousness. She untied, took off the wrist strap, walked to the airlock and buttoned release. She stepped onto the platform of the telescopic escalator which had risen to meet her and stood still, gazing at the sight that had never been twice the same. The freshness of the air went to her head like wine, increasing the sheer exhilaration of the moment.

The spaceport buildings were low, bulbous, many coloured and not particularly handsome. In the distance, tubular buildings, tremendously tall, glittered in the light of the evening sun. That would be Frankland, the city itself. Except for the unchanged green-ness of the landscape—an odd colour for grass and trees Tuanie had always thought—everything was utterly different from the last time. For as far as she could see, there was no one in sight; not even in the bulbous transparent top of Control. The place was still and deserted.

Tuanie stood on the escalator and let it carry her down below ground level. Perhaps spaceport activity was confined to basement level. A long passage met her eager gaze; it was empty. With mounting impatience she walked down passage after identical passage, seeking Control or customs or immigration or police or a bar or anything. She found none of these and saw nobody.

She came at last to a spreading hall surmounted by an enormous bulbous dome through which the sunlight filtered. Under the periphery of the dome, lighted panels indicated the departments for which she was searching but although she opened door after door and peeped inside, all were empty of people. She had the impression of a place abandoned in perfect working order. But that didn't make sense.

Opening a door marked *Ferry Service*, Tuanie's heart leaped at the sound of a voice. "Penutus" it was saying, and it went on saying "Penutus, Penutus." The door swung closed behind her. Let into the walls of the room were metal cabinets on which were lights, banks of vari-coloured buttons and slots of different sizes. On a table in the centre were visi-phones, projector units, micro-files. Besides it were couches. From a grille at the top of the cabinet opposite her a voice still pronounced monotonously "Penutus ! Penutus !" There was nobody in the room.

Tuanie went across; read the inscriptions on the tops of the bulbous buttons. There was, she saw, one labelled "Arrival," and when she pressed it the voice from the grille changed its flat monotone to one of cheerful friendliness. "Welcome to you ! Happy to have you with us. Hope you had a good trip. How's things on Penutus ? Please post your log-reel in orifice 'A.' Have you made your hotel reservations ?"

Tuanie replied automatically before she realised that the only way of communicating with the voice was by press-button. She dropped the log-reel in the slot and pushed the buttons marked 'All's well,' 'Reporting to InterSys,' and 'Hotel required.' The voice said, "Good show! They'll be glad to see you, too," and a card slipped from a slot into a waiting arm which swivelled to hold it out towards her.

'Denibel Super State,' she read. 'Caters for all. Out-space dishes a speciality. Dindanz nitely. Individual attention. Have your Doo at the Super State in super state!' It sounded terrible, she thought but she could always move once she had got her bearings.

The voice said, "Your room-set has been reserved. Number 120 dash 2012. Happy days! Collect log-reel here on departure. Be good!" and then was silent.

Back in the hall, Tuanie saw a notice showing 'CITY' in pale purple letters, and when she went through the arch beneath she found herself at the head of another escalator. As it took her deeper into the earth, she felt depression sweep over her. Her job had made loneliness so familiar that she accepted it, but only in *Bart 4ME*. Mam take it! she thought, when you made a planet after years alone you needed company.

Right here there was no one at all, and perhaps there were no people in the city itself. Perhaps everyone had died or gone away years ago while the city machinery, perfectly fashioned, had continued to function automatically, including the apparatus that had brought her in from the Third Zone. Tuanie shivered; the thought was not a nice one.

At the foot of the escalator a short passage brought her to a series of low platforms; a station of sorts. She stood for a while watching the long narrow cars, suspended from their overhead monorails, slowing automatically to match the pace of the moving edges of the platforms, then, as they reached the ends, accelerating rapidly out of sight. They were all empty, without drivers or passengers.

A car came slowly into the platform marked 'City' just as she reached it and she got in. As it cruised at a little over walking pace, she stared out at the station, wondering at the complete absence of people. Idly she watched another car on a line parallel to hers approach swiftly from the opposite direction: it was obviously a non-stop train. Suddenly, in the split second of its passing, her attention was caught and held. There was somebody in it.

She had a fleeting impression of a white face gazing at her in unmistakeable amazement. She turned to the door to find it closed and

her own car accelerating, but she felt distinctly more cheerful. If there were one there must be others. She checked on the mind picture of the fraction of time. He had had dark hair and had been wearing a uniform of sorts. Good looking in a rather cadaverous way.

After two or three minutes the car began to slow. Tuanie guessed that the next stop would be the city. Those tube-like towers had not seemed very far away. The car slowed still more and the door slid open.

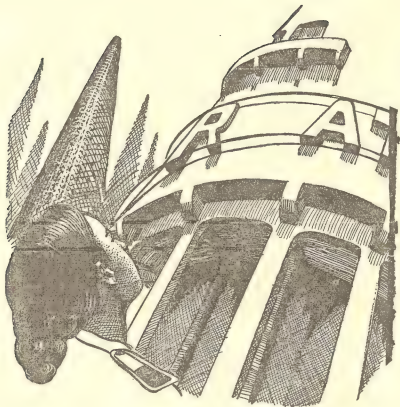
The station was vast and quite deserted, roofed by a single span, sweeping unsupported over a score or more of the same shallow platforms as at the spaceport station, and perforated by rows of circular openings. These were surmounted by bulbous, onion-shaped domes through which the light of the sun filtered in many-coloured rays. Tuanie hurried towards a high arch marked *Exit Main*. On the way she passed the piled debris of two domes which had collapsed through their roof openings. She stared up at the circles which now gaped brokenly to the sky. Far above, the drifting clouds were painted with the first pale colours of sunset. She had not realised that night was so near.

Outside the station, Tuanie found herself on a five-lane balcony sidewalk two removes above street level. The inner, centre and outer lanes were static; the pathveyors separating them rolled silently in opposite directions. In all the visible length of the sidewalk—and it stretched left and right to hazy distances—nothing moved. On the other side of the road, one of the tubular buildings rose massively to the sky. It was bigger than anything she had ever seen, fully 500 metres high and 250 wide. Tuanie knew without investigating that there was no one in it; it had the indefinable aura of disuse.

There was something eerily oppressing about the emptiness, the desolation, of the place, and as she fought to control the feeling of panic that rose in her, Tuanie wondered whether it might not be wiser to return and spend the night in *Bart 4ME*. She felt that if she saw anyone now she wouldn't know whether to run away or cry a welcome.

Suddenly she sensed movement behind her and swung round to see a hand, that had been outstretched towards her, swiftly withdrawn. A woman, dressed in black and wearing a curious shawl-like head-covering, was standing within touching distance. Tuanie jumped and immediately felt a fool for showing her fear. "Oh! you startled me!" she cried.

The woman made no answer and Tuanie saw that she was old, older than anyone she remembered seeing. The skin of her face almost transparently white, hung in flaccid folds. Her shadowed eyes stared at Tuanie with a strange eagerness; her mouth fell open disclosing



toothless gums of a surprising redness. She cackled like an elderly Goon.

Tuanie relaxed. The old woman couldn't be dangerous. "I want to get to the Denibel Hotel," she said. "Can you tell me the way?"

Saliva trickled down the old woman's chin. Her voice was high pitched, her words an almost unintelligible gabble. As soon as she

had finished she leaned quickly forward, pinched Tuanie's arm with thin hard fingers, and scuttled back into the station like an upright black beetle.

Tuanie gaped at her, trying to make some sense of what she had said. It had sounded like 'lower level ask for Carslow.' It didn't seem to make sense unless this Carslow character was the local mine of information. Tuanie located a descending escalator and got onto it. As it carried her downwards, a section of the main roadway flashed into sudden luminous light, dazzling her. The sky was almost dark.

At road level she stepped onto a pathway, staring about her for some sign of life: but there was none, only a row of arched and darkly cavernous entries to tunnels which, presumably, led below the station. She noticed then that another conveyor started close by the foot of the escalator, running for a short distance parallel to the road. Nearby was an illuminated sign, "Push for Carslow." It seemed an odd place for a front door bell, and Tuanie was wondering whether to press it when a banshee wail, like the singing of wires in a wind, cut across the silence of the city. Whatever made it was approaching fast.

Tuanie glanced in the direction of the sound, wondering whether to make a dash for the tunnels, but it was only another machine, a lighted vehicle suspended beneath the sidewalk, racing towards her. So that, she thought, was what Carslow meant. She pushed the button—hoping that the thing worked—and hopped onto the conveyor. The wail changed to a whine and the car slowed alongside her. Doors slid open and she scrambled in. The car was empty.

As it gathered speed, racing in a wide circle to the right, Tuanie watched the pattern of the city repeating itself: park—giant building—park, although the spaces that had obviously once been parks had long ago returned to wild.

Without the warning of click or hum, a gravelly voice above her head said suddenly "Approaching Square!" Tuanie jerked upright in her seat. Those mechanical voices, she thought, were getting on her nerves; better pull herself together.

At intervals the voice came again announcing the stage ahead but no one summoned the car and it neither slowed nor stopped. After another wide swing to the right Tuanie saw that the car was running by the side of the sea; so close to it that the white-topped waves seemed to be breaking almost underneath. Tuanie frowned: there was something wrong somewhere. Then she had it! This wasn't Frankland. Frankland was an inland city. Before she had time to wonder where she was, the voice said "Approaching Denibel!" and she jumped up, searching for a Carslow button.

As the doors slid open she felt as though she were abandoning ship but she leapt out. In front of her was another of the monstrous buildings but with a difference; there were lights in some of the windows. Above a doorway, giant letters proclaimed --NIBEL SU--R--ATE. Behind her the waves broke gently on the shore.

As Tuanie went towards the hotel entrance the wide door glided squeakily upwards and she went in. The door descended, cutting off the sound of the waves; shutting in a complete and unnerving silence.

The place was full of people; at least, that was Tuanie's first impression. Later she realised that there were not more than thirty. Men and women alike, sitting and standing, watching her with unblinking eyes, they were all shabbily dressed and all extraordinarily old. On Penutus she would have assessed them as over the age for dying; over 150.

None of them spoke. They stared at her, nodded to each other as though the sight of her pleased them, and stared again. Their faces were putty-white; their eyes burned bright with a curious excitement. Tuanie inclined her head and went forward to a desk marked *Bookin*.

"You have a room reserved for me," she said to the crone behind the counter. "Mam Reed, Penutus Ferry Service."

The crone slid a sidelong glance at the others. It was almost, Tuanie thought, a crocodile leer but then, the old girl couldn't really help it, she had that sort of face. "Welcome to the Denibel," she said, in a high tinkling voice. "It's been a long time but you're a very lovely girl."

"Thank you," said Tuanie, wondering what the crone meant.

"I'm afraid we have had to change your room-set. Floor 120 is not now in use so we've given you this." She held out a flat metal blank with the number 2.209 stamped on it and a small coloured disc let in to one end. "It's on the floor above and there's plenty of water there: you must have a bathe. The elevator is over there." She pointed a thin white finger.

Tuanie felt like a drink and said so. "When you come down," said the old woman, "all will be ready."

Tuanie held out the metal blank. "There's no key."

The woman's long lids slid lizard-like over her eyes. "That is the key. Place the coloured end in the slot in the door."

As Tuanie walked towards the elevator she heard the hum of an excited conversation break out behind her.

The room was huge; had at one time obviously been luxurious, but now its furnishings and fittings were worn and faded. There were two other rooms leading off it; a bedroom, and a bathroom that took

Tuanie's breath away by its magnificence. That explained, she thought, the woman's 'you must have a bathe.' These people were clearly proud of their bathrooms. As she stood under the warm scented water, Tuanie wondered why they were all so old. There was undoubtedly something odd about them: that prickly, intuitive feeling of foreboding had never yet proved wrong.

When she went down it was as though none of them had moved. All were watching the door of the elevator. The receptionist rose and rustled eagerly towards her. "I will show you the bar." She took hold of Tuanie's arm between surprisingly strong fingers and led her forward to the others who moved to make way and then followed close behind. This time some of them smiled—their old mouths stretching toothlessly into a thin line—and several of them reached out to touch her.

Tuanie found it almost impossible to restrain a shiver: these were not casual contacts but firm, deliberate and embarrassing grasps. For some reason they were interested in feeling her. 'They can't want to eat me, she thought, I wouldn't go round. Besides, most of them have no teeth.

The bar was much like any other; a long counter curved round two sides of the room, there were high stools, tables and couch-like chairs. Some of the tables, she noticed, had been pushed together to make one long one.

Behind the bar a bald and wrinkled old man was slowly stirring something in a jug. His hands were trembling and his eyes wide open and staring. He breathed jerkily as in the grip of some deep emotion. Tuanie sensed the same feeling in those around her and suddenly she knew it for what it was; excitement, the anticipation of some rare pleasure. She sighed with relief: there seemed, after all, to be nothing personal in the feeling. These old folk probably only had a drink when a stranger booked in; some sort of pathetic celebration which brightened their lives.

The old man poured out the drinks carefully and the receptionist distributed them. Everyone drank. It was like a thick, dry wine, Tuanie thought, cool and quite pleasant.

As though the drink were a signal, all the old people started to talk. Old white faces, their eyes shining, pushed close to hers and were pushed away as others strove to get near. The digs and pinches became bolder and more discomfiting. Tuanie found they were talking about her, not to her. No one answered her questions so she gave up and listened.

"She's a lovely girl!"

"Couldn't have hoped for a nicer."

"She's better than nothing but give me a big young man." That seemed frank, thought Tuanie, if somewhat obscure.

"So firm and well-made."

"Her eyes should be most expressive."

"It won't be long now—look at her!"

Tuanie's glass fell suddenly from her hand. Automatically she tried to look down but she could not move her head. Her arms flopped to her sides and she would have fallen from the stool but for the press about her. She felt more hands now and their touch was almost caressing. "She's ready," said a voice at her ear.

Tuanie tried to protest but no sound would come. She felt herself lifted and knew that she was being laid on the tables that had been set together. She realised that the drug she had obviously been given had left her with full sensation but no power of movement. She looked up at the ring of faces, glistening, eager, with slobbery mouths.

The bald barman leaned over her, his wet lips close to hers. "Isn't she a dear? Is she clean? She must be clean!"

The receptionist said, nodding, "I heard her."

Tuanie remembered the oddly phrased "you must have a bathe." Remembered, too, the expectancy in their eyes as she had entered the hotel. Of course! They had known she was coming. And they had been waiting patiently.

Many hands began carefully and unhurriedly to remove her clothes.

Tuanie's eyes fluttered open and she saw that the ring of faces no longer peered down at her, but the light was painfully bright and she closed them again. She must have been unconscious, she thought, although she had understood that they had wanted her to know what was happening. She was still unable to move but she could feel and hear. Voices close by seemed to be in argument.

Someone said, petulantly, "We would have finished by now but she fainted. It's no fun if she's fainted."

"Finished?" thought Tuanie, did that mean they had started? She felt no pain but she could feel the hard flat surface of the table beneath her.

Another voice said, "Denibel gave her too much, the fool!"

Then a new voice, a man's; authoritative and strong, younger than the others. "You all know well enough that this sort of thing is forbidden. Believe me, we shall not hesitate to stop your supplies, and where would you be then?"

The receptionist said sulkily, "We've not done anything."

"I can see that, and it's as well you haven't."

Tuanie heard footsteps approaching the table. She opened her eyes. A man of about her own age, dark haired and with calm grey eyes, was looking down at her. He wore a uniform of sorts. He put one arm round her shoulders to raise her to a sitting position and put a glass to her lips with the other. "Drink this and you'll be alright."

Tuanie felt strength and the power of movement return almost instantly to her muscles. She sat up, swinging her feet to the floor. The man looked at her quizzically. "Feel alright?"

She nodded. "May I have my clothes now?"

He retrieved them from a chair and handed them to her. For a reason which at first escaped her but which afterwards amused her, she retired behind the bar to dress. The old people were still in the room, watching her, but the light had gone from their eyes.

The man in uniform came to sit on a stool and pour himself a drink. He seemed to find nothing abnormal about the scene. "My name's Trad," he said. "You are the girl on the Underway."

"The Underway?" repeated Tuanie, puzzled. "Oh! you mean the railcars. Then you must be the man going the other way!"

"That's right," said Trad. "I got down at the next stop and came back to find you."

"That was friendly," said Tuanie, and added, "because you knew about these people?"

"That's right," said Trad again. "I didn't think they'd find you so soon."

Tuanie grimaced. "I found them."

"Now you're ready," said Trad, "we'll get along. There are some questions I want you to answer."

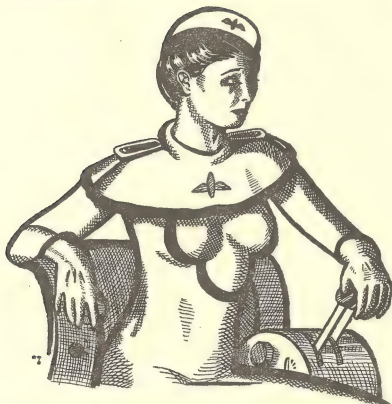
"They can be nothing to mine," Tuanie assured him.

On the way out they were stopped by the receptionist. She asked for the key and wished Tuanie 'goodbye' in her high little voice. "I wish you a happy trip," she said, and smiled so graciously that Tuanie almost made her a bow.

"They're not quite sane, are they?" she asked as the door descended behind them.

"No," said Trad, "but they don't hurt each other." Tuanie thought him almost insultingly casual.

From Trad's apartment in the adjoining block, Tuanie looked inland, seeing the gaunt unlit shapes of the tremendous buildings spaced in their regular rows. She turned to see Trad watching her uncertainly from the other side of the room. She wondered whether he was attracted to her and knew that she hoped he was. "I don't think much of your city, Trad," she said. She left the window and went to the wide couch in the centre of the room.



Trad stayed where he was. "It's not mine. I only come here when I have to."

"What is it called?"

"Gedoz: the biggest city the world has ever seen."

Tuanie remembered the sea that should not have been there. "Is there a place called Frankland?" she asked. "When I was here last that was where I came to."

"Frankland!" Trad's tone was incredulous. "But that's impossible. There was such a place but it was destroyed by earthquakes over 500 years ago."

"Nevertheless," said Tuanie, "I was there and a lot longer ago than that." She felt oddly pleased at his perplexity; it was the first emotion he had shown.

"But . . ." said Trad. "Well, I've seen you and you're young and, and bewitchingly lovely . . ." He paused. "We'd better have a drink."

She watched him as he mixed them. She found that she liked the way his hair grew and the humourous set of his mouth. There was strength and authority in his movements. He filled two tall beakers and sat down beside her on the couch. "I've made them long," he said. "We've got a lot to talk about. Who's to begin?"

"I will," said Tuanie, and she told him about Penutus and the Ferry Service, and tried to explain how time went differently for those who remained at each end of the run and those who worked it. She realised that the time element, at least, was quite beyond him.

"Then the last ferry arrived," said Trad at length, "before I was born. No wonder I've never heard of it."

"You see," he went on, "we don't live in cities now. We've turned our backs on all this sort of thing: on machines and the technology of cities; on all the complexities of such life."

"Why?" asked Tuanie, and he told her that some 350 years earlier something had happened to city people throughout the world. The power to procreate had begun to vanish. "Our history tells us that only those who lived far from cities remained unaffected. It was, of course, a slow process, but no way was found of stopping it. The disease—whatever it was—sometimes skipped a generation or more but the seed of it was there."

"How awful!" said Tuanie, and then, quickly as she realised that many ferrymen and men would have come and gone in that time, "what then?"

"Those who remained normal believed that the technology was responsible for the disease so they turned their backs on it." He shrugged his shoulders. "Whether or not that is true I do not know; but now we will have none of it."

"We?" queried Tuanie.

"All the people of the world," said Trad. "And we want no contact with those who have it."

"But our technology is a long way ahead of this and we're as healthy and as happy as can be." She stopped suddenly, catching her breath. "Or we were when I left."

She saw that Trad had understood her unspoken thought. "Oh, Tuanie," he said and caught her hands. "I hope not."

At length she said, "I haven't found out yet what you are doing here?"

He smiled, his teeth, white and strong, making his sunbrown skin appear even darker. "It's my spell to look after the Olds."

"I'd forgotten about them," Tuanie said, and shuddered at the recollection of pasty faces and the poking, inquisitive fingers. "What would they have done with me?"

"Better if you don't know. They've done some very unpleasant things to the young and the normal. Let's leave it at that. They are among the last to be born in the city. They have been sterile, and worse, all their lives. They will all die soon and there will be no more here." He leaned back, staring through the window at the city outside. "Gedoz will crumble; its machines cease to work, for we do not now understand them and could not repair them if we wanted to. It has already been like this for a century and a half."

Tuanie gasped, amazed at the perfection of machinery which could continue to work untended for so many years. She wondered how many empty cities there were, and how these others lived: Trad and his people. "When can I come to your country, Trad?" she asked.

Trad shook his head gravely, his grey eyes watching hers. "I cannot take you. The old fear still lives and nobody from any other way of life may come near."

Tuanie's voice shook. "But Trad!" she protested, appalled at the thought of so soon beginning another two-year span of loneliness. "I can't stay here!"

"You must go back—and warn others to stay away."

"But that's not possible! No more will come from Penutus, certainly, but there are ships based on Earth which are now on their way. I can't stop them. Although there won't be many. The Ferry Service is ending."

Trad considered this. "So there will be no more contact between us?"

Tuanie told him of the machine she had brought with her. "It's what they call a 'thought-booster,' a sort of machine aid to telepathy. It will make possible instantaneous communication between Earth and Penutus."

Trad shook his head wonderingly. "And with it your people could talk to us here?"

Tuanie nodded.

"Then you must certainly go back." His voice softened. "My poor golden girl! But I'm so glad I was in time."

Tuanie shrugged, at a loss for words. She leaned back on the couch, feeling suddenly alone. Penutus seemed very far away.

In the morning, just before dawn, Trad told her he must leave at once; he was already behind time. His face was pale but determined.

"I'll show you the ship when you come back," said Tuanie, stretching lazily.

"I shall not return," said Trad.

She gazed at him unbelievably, suddenly wide awake. She saw he meant what he said.

"I know too well my limitations. Were I to see more of you, you would persuade me to take you to my country. That I should most certainly regret."

Tuanie looked at him. She could think of nothing to say.

"You may use the rooms for as long as you wish. The Olds will not harm you now."

"But I can't stay here alone!" Tuanie burst out. "I shall go today."

Trad bent his head, avoiding her eyes.

"You will at least see me to the spaceport," she said.

"No!" said Trad, and Tuanie saw by the tightening of the muscles at his jaw the effort it cost him. "I cannot trust myself." He turned to the door.

Tuanie said softly, "Won't you even tell me the way?"

Trad stopped. She saw he was quivering. "Tuanie, you are not a girl. You know what you are doing. You must also know that this cannot be. You go back to your world."

Tuanie regarded him, knowing the attraction to be mutual; confident she could have her way if she so determined. Words slipped out in spite of her. "I suppose you have some one at home?" She turned her back on him and waited.

"There's no one . . . like you." Trad's voice came from the doorway. He said flatly, "Turn right from the exit and right again. The Underway will take you to your station. You know the way from there."

Oh, Trad! she thought, you wonderman! but she didn't move.

"Goodbye, Tuanie."

She turned to see the door closing. "Goodbye, Trad," she said.

As Tuanie journeyed across the city she realised that there were more signs of decay than had been apparent on the night before. Some of the sidewalk bridges were down and lying across one of the park areas was part of the toppled hulk of a tubular building, looking like the rotting carcass of some fantastic caterpillar.

Thoughts came crowding in; of Trad and the horrible Olds; of a control system that must be near breaking point; and, in a rush, of the Earth-based Ferry Service flyers who would leave Penutus long before she could get there to return to—nothing. In the hold of *Bart 4ME*, she remembered, was a small machine and micro'd instructions. If

she could get the thing working she might be able to get the news to Penutus in time—now instead of in a thousand years. It was worth trying.

Back in the empty spaceport hall, Tuanie went to the Ferry Service room and pressed the button marked 'departure' on the cabinet labelled 'Penutus.' She wondered what the voice would say this time.

It was as cheerful as before. "Hope you've had a good stay. Remember to tell your friends about the sights, won't you? There's just no place like it! And come again! Collect your log-reel from orifice 'B.' Have a good trip and—be good!"

When she activated the airlock and stepped inside the ship, Tuanie found it hard to believe that little more than twelve hours had elapsed. She remembered that she hadn't eaten since the previous afternoon but decided to eat later rather than to postpone lifting. There didn't seem any point in staying, even though the thought of two more solitary years after only half a day's break was nightmarish. She felt cheated and sorry for herself. Oh, well! the sooner she started the sooner she would reach Penutus.

There was just one job to be done before shutting in and linking with Control: a matter of pride.

It was the privilege of Ferry Service flyers to name their own ships, and the custom had grown over the years of changing the name after the vacation following each run. What had started in fun, as mere showing-off, was now tradition. Tuanie didn't want to let the side down.

When she had finished, she stood back and admired her handiwork. *Trad 4ME*, looked good, she thought, even though the tears in her eyes made it blur a little.

As she replaced the nameplate behind its transparent outer, it occurred to her that she had no records to take back. Had things been normal, she would have collected from the offices of InterSys an illustrated micro-record of Earth's history to date. As it was, she had nothing except Trad's story.

For a moment she considered going back into the city with a camera but she decided against it. Much wiser, she thought, to get going while Control still worked. She buttoned automatic, watching with relief as the panel lights flashed acknowledgment of the link. Five minutes more on Earth and then two, long, shut-in years. She turned to the door to take a last look at the green fields and trees and the massive towers of Gedox . . . and she screamed.

From beyond the door had come a shout and a thud and now two hands grasped the small projecting platform. Tuanie ran forward, her

foot raised to stamp on the clutching fingers, forgetting for a moment that she had only to close the airlock for it to retract.

She looked out. Trad, an agonized expression on his face, stared up at her. Forty feet below him, the escalator was disappearing into the ground.

She bent down, grabbing his arms and pulling. The side of the ship was as smooth as ice, giving him no foothold. Once she almost fell herself, but at last Trad was in, standing there, breathing heavily. "I couldn't leave you, Tuanie," he panted. "I've come to take you with me." He held out his arms.

Tuanie moved fast. How much of the five minutes had passed while they had been struggling she had no idea, but there must be precious little left. As she swung the airlock she told Trad there was now no way out. The ship's ladder locked automatically with the Control link. "It's desperately important!" she said and found herself shouting. "Do as I say or within minutes we shall both be dead. It may be too late now."

Trad stood looking down at her, utter bewilderment on his face. "But, darling . . ."

Tuanie pushed him with all her strength, toppling him onto the gravcouch. She grabbed the LPs, shoving one into his open mouth and taking one herself. "D'you want to live?"

Trad nodded, his eyes wide.

"Then eat fast!" Reaching across him, she tied them both in, fixed the wrist strap, and lay still, praying that the devastating upward urge would not come too soon. Thank Mam! she sighed. Food was no worry: all ferry ships carried six years' supply of concentrates.

The second ticked by, and Tuanie, feeling consciousness slipping away, smiled at Trad. It was going to be alright.

Trad 4ME lifted into the atmosphere and with nothing but the roar of displaced air it was gone from Earth.

Richard Rowland

Miss Merrill is one of the outstanding women writers of science fiction—apart from stories in her own right she is also one half of the celebrated "Cyril Judd" combination with C. M. Kornbluth. She is also a noted editor of first-class anthologies, having several to her credit. It is therefore a pleasure to print her first British publication herewith, which presents a theme recently discussed in our "Religion and Sex" editorial.

SURVIVAL SHIP

By Judith Merrill

Half a million people actually made the round trip to Space Station One that day, to watch the takeoff in person. And back on Earth a hundred million video screens flashed the picture of Captain Melnick's gloved hand waving a dramatic farewell at the port, while the other hand slowly pressed down the lever that would fire the ship out beyond the orbit of the artificial satellite, past the Moon and the planets, into unknown space.

From Station, Earth and Moon, a hundred million winged wishes added their power to the surge of the jets, as a rising spiral of fire inside the greatest rocket tower ever built marked the departure of the thrice-blessed ship, *Survival*. In the great churches, from pole to pole, services were held all day, speeding the giant vessel on its way, calling on the aid of the Lord for the Twenty and Four who manned the ship.

At mountain-top telescopes a dozen cameras faithfully transmitted the messages of great unblinking glass eyes. Small home sets and massive pulpit screens alike looked to the sky to follow the flare dimming in the distance, to watch the man-made star falling away.

Inside the great ship, Melnick's hand left the firing lever, then began adjusting the chin-rest and the earphones of the acceleration couch. The indicator dashboard, designed for prone-eye-level, leaped into focus. Securing the couch straps with the swift competence of habit, the Captain intently watched the sweep of the big secondhand around the takeoff-timer, aware at the same time that green lights were beginning to glow at the other end of the board. The indicator reached the first red mark.

"The show's over, everybody. We're in business!" The mike built into the chin-rest carried the Captain's taut voice all over the ship. "Report, all stations!"

"Number One, all secure!" Melnick mentally ticked off the first green light, glowing to prove the astrogator's couch was in use.

"Number two, all secure!"

"Number three" . . . "four" . . . "five." The rhythmic sing-song of pinpoint timing in takeoff was second nature by now to the whole crew. One after another, the green lights glowed for safety, punctuating the litany, and the gong from the timer put a period neatly in place after the final "All secure!"

"Eight seconds to blackout," the Captain's voice warned. "Seven . . . six . . . stand by." The first wave of acceleration shock reeled into twenty-four helmet-sheathed heads on twenty-four individually designed headrests. "Five . . ." *It's got to work*, Melnick was thinking, fighting off unconsciousness with fierce intensity. "Four . . ." *It's got to . . . got to . . .* "Three . . ." *got to . . . go to . . .* "Two . . ." *got to . . .*

At the Space Station, a half-million watchers were slowly cleared from the giant takeoff platform. They filed in long orderly lines down the ramps to the interior, and waited there for the smaller Earth-rockets that would take them home. Waiting, they were at once elated and disappointed. They had seen no more than could be seen at the same place on any other day. The entire rocket area had been fenced off, with a double cordon of guards to make sure that too-curious visitors stayed out of range. Official explanations mentioned the new engine, the new fuel, the danger of escaping gases—but nobody believed it. Every one of the half-million visitors knew what the mystery was: the crew, and nothing else. Giant video screens all over the platform gave the crowd details and closeups, the same that they would have seen had they stayed comfortably at home. They saw the Captain's gloved hand, at the last, but not the Captain's face.

There was muttering and complaining . . . but there was something else, too. Each man, woman, and child who went to the Station

that day would be able to say, years later, "I was there when the *Survival* took off. You never saw anything so big in your life."

Because it wasn't just another planet hop. It wasn't just like the hundreds of other takeoffs. It was the *Survival*, the greatest spaceship ever engineered. People didn't think of the *Survival* in terms of miles-per-second; they said, "Sirius in fifteen years!"

From Sunday supplements to dignified periodicals, nearly every medium of communication on Earth had carried the story. Brightly coloured graphs made visibly simple the natural balance of life forces in which plants and animals could maintain a permanently fresh atmosphere, as well as a self-perpetuating food supply. Lecture-demonstrations and videocasts showed how centrifugal force would replace gravity.

For months before takeoff, the press and video followed the preparations with daily intimate accounts. The world over, people knew the nicknames of pigs, calves, chickens, and crew members—and even the proper botanical name of the latest minor masterpiece of the biochemists, a hybrid plant whose root, stems, leaves, buds, blossoms, and fruit were all edible, nourishing and delicious, and which had the added advantage of being the thirstiest CO₂ drinker ever found.

The public knew the nicknames of the crew, and the proper name of the plant. But they never found out, not even the half-million who went to the field to see for themselves, the real identity of the Twenty and Four who comprised the crew. They knew that thousands had applied; that it was necessary to be single, under twenty-five, and a graduate engineer in order to get as far as the physical exam; that the crew was mixed in sex, with the object of filling the specially-equipped nursery, and raising a second generation for the return trip, if, as was hoped, a lengthy stay on Sirius' planet proved possible. They knew, for that matter, all the small characteristics and personal idiosyncrasies of the crew members—what they ate, how they dressed, their favourite games, theatres, music, books, cigarettes, preachers, and political parties. There were only two things the public didn't know, and couldn't find out: the real names of the mysterious Twenty and Four; and the reason why those names were kept secret.

There were as many rumours as there were newsmen or radio-reporters, of course. Hundreds of explanations were offered at one time or another. But still nobody knew—nobody except the half-hundred Very Important Persons who had planned the project, and the Twenty and Four themselves.

And now, as the pinpoint of light faded out of the screens of televisors all over Earth, the linear and rotary acceleration of the great ship began to adjust to the needs of the human body. "Gravity" in the living

quarters gradually approached Earth-normal. Tortured bodies relaxed in the acceleration couches, where the straps had held them securely positioned through the initial stage, so as to keep the blood and guts where they belonged, and to prevent the stomach from following its natural tendency to emerge through the backbone. Finally, stunned brain cells awoke to the recognition that danger signals were no longer coming through from shocked, excited tissues.

Captain Melnick was the first to awake. The row of lights on the board still glowed green. Fumbling a little with the straps, Melnick watched tensely to see if the indicator lights were functioning properly, sighing with relief as the one at the head of the board went dead, operated automatically by the removal of body weight from the couch.

It was right—it was essential—for the Captain to wake up first. If any of the men had showed superior recuperative powers, it could be bad. Melnick thought wearily of the years and years ahead during which this artificial dominance had to be maintained in defiance of all Earth conditioning. But of course it would not be that bad, really. The crew had been picked for ability to conform to the unusual circumstances; they were all without strong family ties or prejudices. Habit would establish the new castes soon enough, but the beginning was crucial. Survival was more than a matter of plant-animal balance and automatic gravity.

While the Captain watched, another light went out, and then another. Officers, both of them: good. Three more lights died out together. Then men were beginning to awaken, and it was reassuring to know that their own couch panels would show them that the officers had revived first. In any case, there was no more time for worrying. There were things to be done.

A detail was sent off immediately to attend to the animals, release them from the confinement of the specially prepared acceleration pens, and check them for any possible damage incurred in spite of precautions. The proportions of human, animal and plant life had been worked out carefully beforehand for maximum efficiency, and for comfort. Now that the trip had started, the miniature world had to maintain its status quo or perish.

As soon as enough of the crew were awake, Lieutenant Johnson, the third officer, took a group of eight out to make an inspection of the hydroponic tanks that lined the hull. Nobody expected much trouble here. Being at the outermost part of the ship, the plants were exposed to high "gravity." The outward pull exerted on them by rotation should have held their roots in place, even through the tearing backward thrust of the acceleration. But there was certain to be a large

amount of minor damage, to stems and leaves and buds, and whatever there was would need immediate repair. In the ship's economy, the plants had the most vital function of all—absorbing carbon dioxide from dead air already used by humans and animals, and deriving from it the nourishment that enabled their chlorophyll systems* to release fresh oxygen for re-use in breathing.

There was a vast area to inspect. Row upon row of tanks marched solidly from stem to stern of the giant ship, all around the inner circumference of the hull. Johnson split the group of eight into four teams, each with a biochemist in charge to locate and make notes of the extent of the damage, and an unclassified man as helper, to do the actual dirty work, crawling out along the catwalks to mend each broken stalk.

Other squads were assigned to check the engines and control mechanisms, and the last two women to awake got stuck with the booby prize—first shift in the galley. Melnick squashed their immediate protests with a stern reminder that they had hardly earned the right to complain; but privately the Captain was pleased at the way it had worked out. This first meal on board was going to have to be something of an occasion. A bit of ceremony always helped; and above all, social procedures would have to be established immediately. A speech was indicated—a speech Melnick did not want to have to make in the presence of all the crew members. As it worked out, the Four would almost certainly be kept busy longer than the others. If these women had not happened to wake up last . . .

The buzzing of the intercom broke into the Captain's speculations. "Lieutenant Johnson reporting, Captain." Behind the proper, crisp manner, the young lieutenant's voice was frightened. Johnson was third in command, supervising the inspection of the tanks.

"Having trouble down there?" Melnick was deliberately informal, knowing the men could hear over the intercom, and anxious to set up an immediate feeling of unity among the officers.

"One of the men complaining, sir." The young lieutenant sounded more confident already. "There seems to be some objection to the division of the work."

Melnick thought it over quickly and decided against any more public discussion on the intercom. "Stand by. I'll be right down."

All over the ship airducts and companionways led from the inner-level living quarters "down" to the outer level of tanks; Melnick took the steps three at a time and reached the trouble zone within seconds after the conversation ended.

"Who's the trouble-maker here?"

"Kennedy—on assignment with Petty Officer Giorgio for plant maintenance."

"You have a complaint?" Melnick asked the swarthy, dungareed man whose face bore a look of sullen dissatisfaction.

"Yeah." The man's voice was deliberately insolent. The others had never heard him speak that way before, and he seemed to gain confidence from the shocked surprise they displayed. "I thought I was supposed to be a pampered darling this trip. How come I do all the dirty work here, and Georgie gets to keep so clean?"

His humour was too heavy to be effective. "Captain's orders, that's why," Melnick snapped. "Everybody has to work double time till things are squared away. If you don't like the job here, I can fix you up fine in the brig. Don't worry about your soft quarters, You'll get 'em later and plenty of 'em. It's going to be a long trip, and don't forget it." The Captain pointed significantly to the chronometer built into the overhead. "But it's not much longer to dinner. You'd better get back to work if you want to hit the chow while it's hot. Mess call in thirty minutes."

Melnick took a chance and turned abruptly away, terminating the interview. It worked. Sullen but defeated, Kennedy hoisted himself back up on the catwalk, and then began crawling out to the spot Giorgio pointed out. Not daring to express their relief, lieutenant and captain exchanged one swift look of triumph, before Melnick walked wordlessly off.

In the big control room that would be mess hall, social hall, and general meeting place for all of them for fifteen years to come—or twice that time if Sirius' planet turned out to be uninhabitable—the Captain waited for the crew members to finish their checkup assignments. Slowly they gathered in the lounge, ignoring the upholstered benches around the sides and the waiting table in the centre, standing instead in small awkward groups. An undercurrent of excitement ran through them all, evoking deadly silences and erupting in bursts of too-noisy conversation, destroying the joint attempt at an illusion of nonchalance. They all knew—or hoped they knew—what the subject of the Captain's first speech would be, and behind the facade of bronzed faces and trimly-muscled bodies they were all curious, even a little afraid.

Finally there were twenty of them in the room, and the Captain rose and rapped for order.

"I suppose," Melnick began, "you will all want to know our present position, and the results of the checkup." Nineteen heads turned as one, startled and disappointed at the opening. "However," the Cap-

tain continued, smiling at the change of expressions the single word brought, "I imagine you're all as hungry and . . . er . . . impatient as I am, so I shall put off the more routine portions of my report until our other comrades have joined us. There is only one matter which should properly be discussed immediately."

Everyone in the room was acutely conscious of the Four. They had all known, of course, how it would be. But on Earth there had always been other, ordinary men around to make them less aware of it. Now the general effort to maintain an air of artificial ease and disinterest was entirely abandoned, as the Captain plunged into the subject most on everyone's mind.

"Our ship is called the *Survival*. You all know why. Back on Earth, people think they know why, too; they think it's because of our plants and artificial gravity, and the hundreds of other engineering miracles that keep us going. Of course, they also know that our crew is mixed, and that our population is therefore . . ." The Captain paused, letting an anticipatory titter circle the room. ". . . is therefore by no means fixed. What they don't know, naturally, is the division of sexes in the crew.

"You're all aware of the reason for the secrecy. You know that our organization is in direct opposition to the Ethical Principles on which the Peace was established after World War IV. And you know how the planners of this trip had to struggle with the authorities to get this project approved. When consent was granted, finally, it was only because the highest prelates clearly understood that the conditions of our small universe were in every way different from those on Earth . . . and that the division proposed was *necessary for survival*."

The Captain paused, waiting for the last words to sink in, and studying the attitudes of the group. Even now, after a year's conditioning to counteract Earthly mores, there were some present who listened to this public discussion of dangerous and intimate matters with flushed faces and embarrassed smiles.

"You all realise, of course, that this consent was based, finally, on the Basic Principle itself." Automatically, out of long habit unbroken by that year's intensive training, the Captain made the sign of the Olive Branch. "*Survival of the race is the first duty of every Ethical man and woman.*" The command was intoned meaningfully, almost pontifically, and brought its reward as confusion cleared from some of the flushed faces. "What we are doing, our way of life now, has the full approval of the authorities. We must never forget that.

"On Earth, survival of the race is best served by the increasing strength of family ties. It was not thought wise to endanger those ties by letting the general public become aware of our—unorthodox—

system here on board. A general understanding, on Earth, of the true meaning of the phrase, "The Twenty and the Four," could only have aroused a furor of discussion and argument that would, in the end, have impeded survival both there and here.

"The knowledge that there are twenty of one sex on board, and only four of the other—that children will be born outside of normal family groups, and raised jointly—I need not tell you how disastrous that would have been." Melnick paused, raising a hand to dispel the muttering in the room.

"I wanted to let you know, before the Four arrive, that I have made some plans which I hope will carry us through the initial period in which difficulties might well arise. Later, when the groups of six—five of us, and one of them in each—have been assigned their permanent quarters, I think it will be possible, in fact necessary, to allow a greater amount of autonomy within those groups. But for the time being, I have arranged a—shall we call it a dating schedule?" Again, the Captain paused, waiting for tension to relieve itself in laughter. "I have arranged dates for all of you with each of them during convenient free periods over the next month. Perhaps at the end of that time, we will be able to choose groups; perhaps it will take longer. Maternity schedules, of course, will not be started until I am certain that the grouping is satisfactory to all. For the time being, remember this—

"We are not only more numerous than they, but we are stronger and, in our social placement here, more fortunate. We must become accustomed to the fact that they are our responsibility. It is because we are harder, longer-lived, less susceptible to pain and illness, better able to withstand, mentally, the difficulties of a life of monotony, that we were placed as we are—and not alone because we are the bearers of children."

Over the sober silence of the crew, the Captain's voice rang out. "Lieutenant Johnson," Melnick called to the golden-haired, sun-tanned woman near the door, "will you call the men in from the tank-rooms now? They can finish their work after dinner."

Judith Merril.

Machines are becoming more and more perfect in their functional powers while the human body still remains a complex but unpredictable mechanism. Test pilots on the early rockets are more likely to break down than the machines they will ride in.

SAMSON

By Alan Guthrie

He was small and thin with mousey hair and ears which seemed too big for his head. He wore a boy's suit and boy's shoes and had nicotine-stained angers which, if it hadn't been for his eyes, would have made him look like a juvenile delinquent. His name was Samson, a typical example of inappropriate terminology and God knows what he must have suffered from that ridiculous appellation.

He looked up as I entered the room, putting down a magazine and trying to appear at his ease. He didn't make a very good job of it.

"Well, John," I deliberately didn't use his surname, "you're in."

"Good!" The way he said it made it sound like a prayer. "When do I start?"

"Right away." I sat down beside him and offered my cigarettes. "Security have checked you and you're clear. Medical like what they found and so you're in." I gave him a light. "Nervous?"

"Should I be?" His defence mechanism was something he couldn't get rid of in a hurry. "What happens next?"

"The hard part. Tests for reaction times beneath high accelerations. Tests for intelligence beneath conditions of outside distracting stimuli. Tests for altered metabolism. Tests for every damn thing you can think of and a few more beside." I smiled at his worried expression. "Don't let it get you. If medical passed you that part will be easy."

"Will it?" He didn't seem any too willing to accept my statement. He leaned forward a little, the couch was low enough for his feet to reach the floor, and stared at the hands he had rested on his knees. "Look. I've hidden nothing and told you all I could. Are you sure that you're not making a mistake?" He looked up at me as I didn't answer. "I'm not a pilot. I've never even been off the ground except for one time I bought ten minutes of air-travel on a pleasure flight. I've no degrees or specialised training. Are you sure that I'm the man you want?"

He wanted me to say yes. He wanted me to reassure him and tell him how good he was. He wanted me to do the one thing I wasn't going to do because unless he could stand on his own feet he was useless both to himself and us. And we needed him. I looked at the pile of magazines.

"Been thinking it over, John?"

I knew he had, that was why he had been left alone in the room. Some of the pictorial supplements of the magazines weren't very nice to look at—not for someone who expected to go through the same thing himself. I picked up the issue he had put down and riffled it until I came to the too-realistic pages showing the effects of high acceleration on the human visage.

"He recovered," I said quietly. "The effects weren't permanent."

"I wasn't thinking of that."

"No?" I riffled the pages again. "This one didn't recover. We lost both him and his ship."

"What of it?" He drew at his cigarette and swore when he found that it had gone out. "We've all got to go sometime."

"Then what are you worried about?"

He didn't have to tell me the answer. His failure, of course, not ours. But, though he didn't know it, his failure would also be mine. When you are dealing with equipment worth millions, machinery which could be turned into molten rubbish by a moment's panic, then the human element has to be eliminated as far as possible. That was my job. I was the liaison officer between flesh and metal, between men and machine. I had to be certain that the man I chose for the job wouldn't break at a critical moment and all I had to work with was intuition, common-sense, and what psychology I had learned from men who still admitted that the whole field was still an art and not a

science. Those who insisted that it was a science weren't worth learning from.

"You won't fail." I spoke to convince him, not me. I would be staying on the ground, safe no matter what happened. Samson would be the one to risk his neck. "As for your lack of previous training, forget it. An airplane pilot has less advantage than you, he'd have to unlearn all he's been taught. A glider pilot the same. What you need to know will be taught and taught well."

"Will it?" He smiled with restored confidence. "Good. I was worried for a minute. Not about that," he flipped his finger against the magazines, "but of having my chance and . . ."

"Falling down on the job?"

"That's it."

"You won't fail." I glanced at my wrist watch and headed towards the door. "I'll see you tomorrow at ten. The sergeant will tell you where my office is and fix you up for the night. Anything else you want to know now?"

He shook his head and, as I left the room, he was already reaching for the magazines.

That was the first time I saw Samson. It wasn't the last, of course, from then on I was closer to him than any brother. We did everything except sleep together, and I mean everything. Gradually, as the tests and training progressed, I managed to get beneath his outer defences, dig deep into his subconscious, and find out just what made him what he was.

It was the same old story.

God knows how many lives have been ruined by the compelling desire to escape. Most of us manage to compensate in some way or another. A few of us are lucky. The great majority carry a load of guilt and repression with them all their lives. A century ago it wouldn't have been so bad. There were new frontiers then, new worlds, a chance to start again away from the familiar surroundings. But not now.

Samson had started life with everything against him. An orphan, stunted, undeveloped, a weakling with a ridiculous name which blind pride and stubbornness had made him keep. It was no surprise that he wanted to run away from a life which had hurt him so much. To me the surprise was that he hadn't tried it before—permanently, but life to him, bitter as it was, was still sweet and, as he grew, his pride crystalised into a resolve to prove to the world that he was a man.

Some do it by early marriage and endless children. Some do it by violent crime, a few with constructive work, fewer still with the fruits

of their talent and genius. Samson wanted to do it by getting into space.

And the very thing which had made his name a joke gave him his chance.

I stood watching him as he worked at his final training. He sat on a seat before a panel dotted with coloured lights, his hands resting on twin levers which he moved in response to the signals. Normal enough, easy enough too except that klaxons blared in his ears, the seat jerked beneath him in an erratic, unpredictable pattern, and blasts of hot and cold air slammed against his features. Colonel Maguire joined me as I stood watching.

"How's he shaping?"

"As expected." I knew that Maguire wasn't talking about the training. "Normal escape pattern."

"Reliable?"

"As far as any neurotic can be."

Maguire didn't like that word and showed it. Like most men he had the idea that space should be conquered by clear-eyed heroes, broad-shouldered, stable, the typical adventurers of history. He had had to accept facts but he still didn't pretend to like it, and found compensation in the future when men, not dwarfs, would ride the ships into space. He managed to smile as Samson joined us.

"Captain Westcote is pleased with you," he said. "How do you feel?"

"Great." Samson expanded his chest. "The sooner I start the better."

"It won't be long now." Maguire stared after Samson as he moved towards his shower. "When?"

"He's given you the answer. Delay may cause a reaction. At the moment he's riding high and ready to tackle anything. Keep him hanging about and he'll hit emotional bottom and have to be built up again."

"We've a test scheduled for tomorrow," said Maguire thoughtfully. "I was going to send it up on pure remote but if you think he's ready."

"He's ready."

"Right! Tomorrow at dawn." He was moving away when I caught his arm.

"How many more, Colonel?"

"I don't know," he said, and though the station was air-conditioned and warm, he shivered. "I just don't know."

Dawn came as it always does and with it came Samson's big moment. He looked ridiculously small against the technicians dressing him in

his high-G suit, and, for a moment, I felt like yelling for him to stop. I didn't. He wouldn't have thanked me for it and, if I had been eighteen inches shorter, a hundred pounds lighter, and thirty years younger I'd have probably taken his place. Probably—it's easy to talk that way when there's no chance of getting the opportunity.

I walked out with him to the ship and, as usual, stood for a moment letting my eyes drink it in. It was beautiful—they all were—tall and slender, curved with a subtle grace and seeming to strain from its fins towards the still-dark sky. Maguire was there, a shoal of technicians, a couple of camera men, and enough high brass to form a regiment. Among them Samson was almost lost, a crow among birds of paradise, but small and insignificant as he looked yet this was his day. A couple of technicians helped him up the elevator to the cabin and strapped him in. They dogged the air-tight door behind them and, after they had descended, the elevator moved away. We moved away too, back and down towards the bunkers and the masses of monitoring and recording equipment, the grim men seated on immobile chairs, the blur of sound from the wall-speakers and the mounting tension as the sweep second hands of the chronometers swung around the impassive white faces.

Zero second—and I almost died.

I always did. A part of me was in that ship. A part of all of us was in it, but my part was flesh and blood while theirs was metal and plastic. I was responsible for the human element and, before I could pass it, I had to make friends with it. To me the tiny figure hunched in the cabin wasn't expendable. Samson was my friend. We had lived too close too long for us to be anything else. I had opened his mind and looked at what made him tick and it is not possible to do that without having sympathy, empathy, call it what you like. But it's the same feeling a father has for his son, a mother for her child, a brother for his own flesh and blood.

To me Samson was no stranger.

The noise from the speakers died and settled into the steady hum of the carrier wave. On the panels before us the dials and needles kicked and swung as they emulated those in the ship now almost ten miles above. A technician checked them then held up his left hand, thumb and forefinger curved into a circle. So far, so good. Maguire stepped over to the microphone.

"Samson! Come in when ready. Samson. Come in when ready . . ."

"Stop it!" He outranked me but I didn't think of that. "He'll come in when ready. Don't spoil it."

"Sorry."

He didn't have to apologise. It was the human element again, this time impatience, but it was the human element we were trying to eliminate. I felt sweat begin to moisten my forehead as the long seconds ticked on their way to oblivion.

"Hello!" The voice was thin but clear. "Samson here. Can you hear me?"

"Receiving you," droned a technician. "Keep talking."

"Where's Westcote? Is Captain Westcote there?"

"Here." I stepped past Maguire to the microphone. "Did you speak as soon as you recovered?"

"Yes."

"Any ill effects?"

"I've got a headache and my nose is bleeding a little but otherwise I'm all right." He chuckled. "This is it, isn't it, Bob?"

"This is it," I said and tried to sound all excited. "Keep talking, John. Your experiences are important. We're recording everything you say on tape."

"Good. I wouldn't want any of it to be lost." He chuckled again, already imagining himself in the history books. "Height one ten. Temperature . . ."

I didn't listen. It wasn't necessary, I could read all the information on the monitoring dials, and beside, I had heard it all before. Maguire jerked his head and I followed him out of the bunker.

"Let's grab some coffee. He's going to be up there for a long time yet."

"How high you taking him?"

"All the way."

"Max exposure." I nodded. I had expected it but not so soon.

"You've ironed out the orifice degeneration then?"

"Did that two ships ago." Maguire sighed as he slumped into a chair and gestured towards the uniformed waiter. "The rest of it is up to you, Bob."

It wasn't, of course, but I knew what he meant. The ships were, from an engineering standpoint, almost perfect. They could reach the Moon, had done, and return—but only by remote control. Sitting in their bunkers the real pilots could control every move of the ship with their hard-won skill and extensive training. But radio has limitations and, while a couple of seconds delay was just bearable, minutes, even one minute, was not, and it took from eight minutes for a signal to reach Mars and return. Good enough for a long-range missile, but hopeless when landing a space ship.

And we weren't building long-range missiles.

We were building space ships and space ships must be able to carry men. Our ships could carry men, and did, but there was something wrong. Men couldn't go out into space—and live.

For a while, yes. For anywhere near long enough to be of use, no. Animals could, but animals were useless for our purpose. We could put animals in containers, send them out, and bring them back apparently unharmed. Apparently. But animals couldn't read instruments, couldn't pilot the ships, didn't have that ineffable something which had lifted men from four feet and made him reach for the stars.

We had to find some way of getting him there.

Shielding could have done it, but we couldn't spare the weight for shielding. We couldn't spare the weight for anything which is why we picked the undersized men as pilots. We could load them in with the remote control equipment so that, in case of trouble, we could bring them back and the expensive rocket with them. That way, too we could avoid costly training aside from some routine exercises so as to study their reactions to outer space conditions. They were expendable—the rockets were not.

I thought of Branson who had come back with his internal organs twisted to hell and who had shown us how to make a high-G suit which really worked. I thought of Yendle who had taught us not to use a certain alloy for hulls if we didn't want our crews to die from radiation-induced skin cancer. I thought of Pearson, and Thorne, and Clay. I thought of the two dozen men lying in darkened wards, each one a modern martyr to progress, each having contributed their fragment towards the day when real men could pilot their own ships towards the planets.

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I thought of Samson and hoped that he would be the lucky one.

The bunker was a haze of cigarette smoke when we returned. Maguire went straight across to the monitoring panel then jerked his head towards me with quick impatience. A look at the signal was all I needed.

"When?"

"About two minutes ago. We guessed what was happening and triggered the sleepy gas." The technician hesitated. "He was asking for you when . . ."

"Which alloy are you using?" I looked at Maguire trying not to feel guilty at having been away. There was nothing I could possibly have done for the little man but sometimes even words or a familiar voice can be of comfort. Especially when you're a thousand miles high and a long way from home.

"X1137," said Maguire and looked a little sick. "We gambled on its lighter weight."

"Is it the same basically as thirty-six?"

"Yes."

It was all I needed. I couldn't blame Maguire. He was in the position of a man shooting at a black cat in a lightless cellar. One thing could be right, a thousand things could be wrong. Even at that his average had been pretty high and he was ridden by the twin devils of weight and strength all the time.

"We're bringing him down," said the technician. He looked curiously at me before turning to Maguire. "Shall I notify the Medics?"

He didn't have to say that. He didn't have to look like that either, but I couldn't blame him. It was getting too monotonous, too grimly regular for even men who lived with steel and wire and, merely because they were human, they needed a scapegoat. I was grateful to Maguire when he dropped his hand on my shoulder. It was hard for the both of us.

I was on the field when the ship landed. I was at the heels of the technicians as they stripped off the hull plates around the cabin. It was easier to do that than to mess around in the cramped cabin and, anyway, the shielding had proved useless.

Samson was just recovering consciousness as they carried him past me and towards the ambulance. He tried to smile, confident that he had done a great thing, but he wasn't smiling at me. He wasn't smiling at anyone.

Like Barker before him he had tested the ship in the only way possible, by trying it. Like Barker before him he had paid the price



Three hundred years out from Earth on their journey to the system of Pollux the five thousand people on board the Ship had few connections left with the planet upon which their ancestors had been born. Old age amongst the personnel was unknown—yet there was at least one man who had passed his allotted span. For a special reason. . .

STAR SHIP

By E. C. Tubb

Illustrated by QUINN.

Part Two of Three Parts.

FOREWORD

Fired by the discovery of planets circling Pollux, a star only thirty-two light years away from Earth, the Builders had planned and launched a mighty spaceship capable of bridging the vast interstellar gap between the two systems. There being no way in which to overcome the Einsteinian equations setting the speed of light as maximum velocity they had aimed the ship at Pollux at one tenth the speed of light, stocking it with five thousand people and everything necessary for their survival; even though the voyage would take well over three hundred years it was assumed that the descendants of the original volunteers would survive and finally colonise the distant objective.

In three hundred years the aim and purpose of the journey had become vague and unreal, the ship had become known as the Ship, and by a balanced ecology births and deaths were predetermined by Psycho, an electronic machine which determined the fitness of personnel to either have children—or die. It was the business of dying which concerned Jay West, a fourteenth generation descendant, whose job, as one of the secret Psych

Police, called for legitimate elimination of unfit personnel—those who for one reason or another were no longer of essential use to the Ship. But only the Psych Police and the officers of the Ship knew that no-one lived to a natural old age.

As a vent for passions and hereditary unrest, which was gradually being bred out of the inhabitants by selected breeding, legalised duelling had long been in force on board. Those not killed by this method were 'eliminated' by one or another of Jay's colleagues.

Watching a case brought for trial at Ship's Court presided over by Gregson his chief, Jay is called to investigate an 'accident' in his sector—an electronics engineer had apparently been electrocuted (virtually an impossible situation)—and Edwards the victim's room-mate was convinced that it was murder. Realising that it was an "elimination" Jay is forced to take the man to headquarters because he had recognised Merrill the policeman who had bungled the assassination, and charges him with the murder. Edwards is sent to the converter and the police have made two eliminations instead of the one. But these incidents are becoming prevalent—the more intelligent are beginning to realise that nobody lives to be more than forty years old.

Jay, officially a ventilation engineer, is half in love with Susan Curtway, a Maternity nurse in Merrill's official sector, but cannot marry her as the police are exempt from ordinary laws. He knows that Merrill is also interested in Susan and there is friction between them, especially when Chief Gregson warns Merrill that Jay will eliminate him if he bungles another killing. Merrill, who aspires to Gregson's position, decides to do something about it before it is too late. He secretly employs Sam Aldway, a disgruntled Hydroponics worker, to kill Jay in a duel, promising him a position with the Psych police if he is successful.

Meanwhile, Quentin the Ship's Captain, and the only old man on board, holds a council of Executive officers to plan the elimination of the Barbs, a small group of people who have escaped into No-Weight, the unused section running through the axis of the Ship. Although previously unorganised they are now making raids for food and becoming a nuisance, but no solution is offered to dispose of them, No-Weight being a vast unlit space too large to be adequately investigated. At the meeting the Captain informs Gregson that George Curtway (Susan's father) has requested an interview with reference to Psycho. Private interviews with the Captain being forbidden, Gregson agrees to handle it.

Jay meets Susan during an off-duty period and despite her warm affection indicates that there can be nothing between them and that she had better prepare for her marriage period with some eligible male. They part on a bitter note and Jay returns to headquarters to pick up his latest elimination order. It is for George Curtway!

VII.

There were times when Jay hated his work. Not many, for like all the Ship's personnel he was efficient and took a pride in his job, but sometimes, like now, he wished that he had belonged to anything but the psych-police. It was his fault, of course, he should never have allowed himself to become so intimate with people who, by the very nature of things, must inevitably become his victims. But self-blame, like self-justification, were both a waste of time. He still had to kill Susan's father.

Had to. Indoctrination, conditioning, his own pride in his work and his knowledge that, should he refuse, he would be 'eliminated' as unfit left him no choice. George Curtway had to die.

But Jay wished that he didn't love the man's daughter.

He changed before entering sector five, reversing his black shorts for the red ones of the ventilation engineer he was supposed to be in his unofficial sector, and made his way down towards the lower levels. Usually on such a mission he felt excited, the thrill of the hunter stalking the hunted, his wits against those of the selected victim with the rules heavily in his favour. And yet, even with the protection his official status gave him, there was always an element of danger.

He could be clumsy. He could bungle, be seen by witnesses, or do such a poor job of staging the 'accident' that he would be judged inefficient and be eliminated in turn. Murder, even with the victim unaware and unprepared, was not always easy.

And now he felt none of the thrill, none of the warmth of released adrenaline or the excitement of the hunter. Now he felt a vague regret and a disinclination to do what must be done. He recognised the danger and deliberately focused his mind on his victim, forcing himself to forget Susan, their close friendship, their love and everything about them. Her father had to die and, as far as Jay was concerned, that was all there was to it. He felt a little better by the time he reached the lower levels where the games and recreation rooms were.

George wasn't in any of the rec-rooms, nor the exercise rooms, nor in the private cubicle his status allowed. Jay knew that he could locate the man by enquiring at the work-office, Curtway could have been out on a job somewhere, but to do that would be to leave a clue and maybe arouse suspicion. He was staring into the mess, trying to find the man he was looking for, when someone touched his arm.

"Jay! I didn't expect to see you again so soon. Don't you ever work?" It was Susan, the last person he wished to see, and looking down at her he wished that they had never met.

"Hello, Susan." Deliberately he made his voice casual. "Eaten yet?"

"Not yet." She linked her arm through his and smiled up into his face. "Let's eat together, shall we?"

"If you like." Casually he slipped his arm from hers as they moved towards a vacant table and, after they had sat down, ordered without paying much attention to the menu. Susan kept glancing at him, seeming about to speak once or twice, then, pushing aside her empty plate, touched his arm.

"Anything wrong, Jay?"

"Wrong?" He looked at her, forcing himself to smile and annoyed with himself for betraying his emotions. "No, of course not. What makes you think that?"

"Your appetite for one thing." She gestured towards his unfinished meal. "I've never known you so slow before."

"I'm not hungry."

"Then you shouldn't have sat down to eat." Susan glanced over the mess hall. "Better finish it up, Jay or someone will accuse you of waste. There's a man standing over by the far wall who seems very interested in you as it is."

"Is there?" He didn't turn his head to look, guessing that it was Susan the man was interested in, not her escort. But he finished his meal all the same, refusing a sweet and sipping his water while Susan spooned up the last of her synthetic fruit.

"When am I going to see you again, Jay?" Susan smiled as she leaned forward and touched his hand. "After shift?"

"I doubt it."

"When then? Tomorrow?"

"I don't think so." He looked down at the table as he spoke. "I'm pretty busy right now and it's hard to know just when I'll be free." He stared at her, his face expressionless. "In fact, Susan, you'd better not rely on seeing me again."

"What!" She stared at him a moment, her hand gripping his arm, then laughed. "Jay! Don't say things like that!"

"I mean it, Susan." Deliberately he removed her hand from his arm.

"You're joking! You couldn't mean it, not after what we've been to each other." Her eyes searched his face. "Please, Jay, say that you're not serious."

"I am serious," he said flatly. "There's no future in it for either of us and it would be best if we never met again."

"Jay!" There was hurt in her voice, the deep pain of outraged emotion and broken illusion. He heard it, knew that he was being deliberately cruel, and yet, at the same time, knew that it was the only thing he could do. He stared into her soft, brown eyes.

"Listen, Susan," he said curtly. "Let's not get foolish over this. We've had fun and I've enjoyed knowing you, but it's all over now. Let's forget it, shall we?"

"Jay!" For a moment he thought that she was going to break down. Tears filled her eyes and her hands showed white knuckles as she gripped the edge of the table. Then pride came to her rescue, the outraged pride of any woman who has had her affection flung back into her face, and together with that pride came anger at having been taken for a fool. She stiffened with youthful dignity.

"All right, Jay. If that's all it meant to you?" She paused, hopefully, and for a moment he was tempted to say the word that would remove her pain and restore her smile. He didn't say it.

"It was fun," he repeated stubbornly. "It should never have become so serious. It's best that we part now before any damage is done."

"I see." She stared down at the table, then, with a brave attempt at casualness, glanced around the mess hall. "Don't bother to justify yourself, Jay. As you said, it was fun. I've been a fool, I suppose, but . . ." She swallowed. "This is the end, then?"

"Yes."

He didn't look at her as she rose from the table. He didn't follow her with his eyes as she stumbled towards the door and to the privacy of the nearest unoccupied rec-room. She would cry, he thought dully. She would vent her emotion in tears, hate him, despise him and then, after a while, forget him.

But the thought didn't make him happy.

He sat for a while, sipping his water and trying to bring his mind back into focus and the job at hand. There was no particular hurry, he knew that, but he wanted to get the thing over and done with long before the three-shift period of grace allowed. The hard part was over, he had managed to make Susan hate him, and all that was left was a simple job of murder.

He was leaving the hall when a man stepped forward and collided into him with sufficient force to send him reeling against a table.

"You!" The man pressed his hand to his side, his face distorted with synthetic pain. "Why don't you watch where you're going?"

"Sorry." Jay was in no mood for argument and he was in a hurry. He tried to step past the man, then halted as a hand gripped his arm.

"Not so fast! You hurt me."

"So what?" Jay stared at the sullen-faced man in the brown shorts. "I apologised."

"That's not good enough," said Sam Aldway deliberately. "It's about time your sort were taught that you can't go around hurting people." He looked at the little crowd that had gathered around them. "You all saw what he did," he shouted. "I say that it isn't good enough."

"Take your hands off me." Jay jerked his arm then, as the man tried to grab him again, pushed him back. "I told you to keep your paws to yourself."

"You hit me!" Sam appealed again to the crowd. "You all saw him hit me."

"Don't be a fool." Jay fought his rising anger and spoke as calmly as he could. "We bumped into each other and, if I hurt you, then I'm sorry. I've apologised, I can't do more. Now shut up and leave me alone." He stepped forward, trying to thrust his way through the press of bodies, then turned as a hand clawed at his shoulder. "I told you to leave me alone."

"Oh no you don't." Sam grinned, conscious of being the centre of attraction, and spoke directly to Jay. "You're a dirty, stinking, lousy waster," he said loudly. "And I want to know what you're going to do about it."

It was so raw as to be ludicrous. The man was an arrogant, loud-mouthed fool, and he was clumsily trying to force Jay into a duel. Jay knew it, knew too that he, with his superior training, would be certain to win, and for a moment was tempted to work off some of his frustration and anger in violent physical combat. He shook his head and laughed.

"So I'm a waster, am I? Then why don't you call the psych-police?"

"You mean that you refuse to fight?" Incredulous anger twisted Sam's face into an animal-mask of hate. "Why, you rotten coward, call yourself a man? I've called you a waster. Did you hear that? A dirty waster, and I'll show you what I do with wasters." Before Jay could guess what he was about to do Sam had stepped forward and swung his open hand against Jay's cheek. The sound of the slap was followed by a startled hush, a hush broken by the soggy impact of bone against flesh.

Normally Jay would never have done it. Normally his innate caution and the grim necessity to put his assignment above all else would have forced him to swallow the insult, accept the inevitable sneers of cowardice, and to go on his way. It would even have helped him, men do not fear those they despise, not until they are in a position to do nothing about it. But Jay wasn't normal.

He was still raw from his parting with Susan, sick with the knowledge of what he had still to do, and his emotions over-rode good sense as he swung his fist deep into the flesh of the other's stomach. Coldly he stared at the writhing man at his feet, knowing that now he had gone too far to back out. There was no brawling in the Ship, there couldn't be, not with five thousand people living too close together with the resultant emotional friction and sudden impulses. A brawl could start a riot which would ruin irreplaceable material, injure essential workers and kill the innocent parents of the new generations.

Like it or not Jay had to fight a duel.

VIII.

The Stadium was on the lowest level next to the exercise rooms. From a sanded floor rows of tiered seats sloped up to a high roof and, when Jay and Sam arrived followed by the interested crowd, a couple of women were fighting a bloody battle with razor-edged knives to the amusement of the usual watchers.

Both well over thirty, they fought with the ferocity of tigers, the gleaming blades slashing at yielding flesh as they spun and dodged on the absorbent sand. From the crowd came a soft half-sigh, half-groan as one of them slipped, falling onto one knee her knife-hand resting for a moment on the floor. Quickly the other moved in, her blade a lancing arc as the needle point thrust through skin and fat, muscle and sinew towards the pulsing heart beneath. Triumphant she grinned towards the audience, kissed her bloodstained fingers at the referee and walked, staggering, towards the exit.

Jay watched her, trying to guess from her wounds whether she would be healed or eliminated. From her age, the blood she had lost, and the obvious skill in which she had used her weapon, he guessed the latter. Expert duelists, while encouraged up to a point, became dangerous when they lost their sense of proportion and vied with each other in the number of their kills. The Ship had no room for blood-crazed beasts.

The referee checked them in, making the routine inspection of their forearms, and asking the usual questions.

"Are you both certain that you can't settle your differences in any other way?"

"I'm willing to call it off," said Jay. He looked at Sam. "And you?"

"Not a chance."

"I see that this is your first duel." The ref stared at Jay's unmarked forearm, then at the five dots on Sam's. "As a first-timer you have

the choice of weapons, also," he stared hard at Sam, "you will not be killed in this encounter." He looked back at Jay. "How will you fight?"

"Bare handed." Jay had no intention of getting cut or slashed by knife or machete and, aside from anything else, he was skilled in the arts of unarmed combat. Already he was regretting having agreed to fight at all, it was too easy to be injured in the stadium and even the most experienced fighter could fall victim to an unlucky blow. Without weapons, however, there was little chance of anything worse than a beating up.

Their turn was scheduled for after the next bout and he waited impatiently while a young, optimistic man just out of marriageable status took on a well-muscled woman about ten years his senior. Fights between mixed couples, while rare, were not uncommon. Equality between the sexes demanded utter lack of distinction though, as in this case, the bout was usually fought with padded clubs, painful enough, but capable of inflicting little more than a bruise. In effect it was a comedy turn and the crowd greeted the young man's defeat with catcalls which turned to ribald cheers as the woman, dropping her club, picked up her opponent and carried him tenderly from the arena.

Jay smiled, guessing that another domestic problem had been solved the hard way, then lost his smile as the referee gestured towards them.

"Right. You two are on now. Remove your sandals, walk out five paces apart and, when you reach the centre, turn and fight."

Jay hesitated, glancing at Sam then, as the other made no move, shrugged and strode out into the arena. The space was about twenty yards long and fifteen wide, brilliantly lit so that the surrounding faces of the watching crowd merged into a formless blur. The attendants had cleared away the debris of the previous bouts, raking the sand and removing the discarded weapons, and the fine grit felt warm and smooth between his naked toes. Now that the moment had arrived he felt calm and, as he strode forward, valued his chances. There was a slight disadvantage in coming out first for he could not be certain just where Sam would be, but that disadvantage would be off-set by his superior skill.

He turned as he reached the half-way mark, springing to one side and poising on the balls of his feet. Sam glared at him, paused just as he was about to spring then, before he could recover his balance, Jay had stepped forward and slammed his first towards the other's jaw.

He missed, but he had expected it, and, as Sam swayed to one side, his other hand drove forward towards the stomach. He grinned as he felt the blow smash home and followed it with two more, one to the

head and one to the heart, crowding forward so as to keep the other off-balance and smashing at him with all the force of his back and shoulder muscles.

For a moment he thought that the fight was over almost before it had begun. Sam gulped, tried to cover, then, as blood gushed from his pulped nose, screamed with rage and flung himself forward, his hands reaching for Jay's face and throat.

Immediately Jay was fighting for his life.

It was dirty fighting, but it was more than that. It was the double attack possible only to a trained fighter and, as Jay felt the other's hands smash at vital nerves, he felt the first doubt as to his success. The double attack he could handle, he used it himself, but, as they fought, he became aware that Sam knew far more than any ordinary duelist should.

A knee thrust at his groin at the same time that stiffened fingers stabbed at his eyes. He twisted to avoid the knee, knocked aside the threatening fingers, and tasted blood as a lowered skull smashed into his face. Again the knee jerked towards him and, in avoiding it, he fell victim to a slash from the edge of a palm directed towards his throat. The double attack, the system of two separate blows at the same time directed towards different parts of the anatomy. Each following the other without pause, knee to groin, fingers to eyes, fist to stomach, skull against face, edge of palm towards throat, elbow and shoulder, knee and foot without pause or time for the victim to recover his balance.

For a while they weaved like fencers, body against body, arms and legs moving in smooth, synchronised rhythm as they delivered and countered blows, their sweat-streaked bodies glistening beneath the glare of the lights. Then, as Jay felt his left arm go numb, he broke away and ran towards the end of the arena.

Sam was dangerous. Sam knew too much and, as he avoided the other's rush, Jay frantically massaged life and feeling into his numbed arm. How or where the duelist had learned of the subtle nerve-blows which could maim and paralyse Jay didn't know, but that he did know them his numbed arm gave shocking proof. Jay knew them, all the psych-police did, but that information was carefully kept from the Ship personnel. It was too easy to kill a man with that knowledge and, as he stared at the crouching figure of his opponent, Jay revised his previous opinions as to the certainty of his victory.

There is a state of mind indispensable to a fighter if he hopes to win. Contempt has no place and neither has indifference. Everything has to be sublimated to a single objective and every emotion and thought

fined to a needle point directed at one aim. To kill. To rend and tear, to smash and destroy, to crush and vanquish. Sam had it, it was apparent in his eyes, his mouth, the very set and stance of his body. Before he could hope to meet the man on equal terms Jay had to acquire it too.

For him it was simple.

He moved forward as life returned to his numbed arm, dodged a handful of sand flung towards his eyes, and struck out with his left fist. Sam knocked aside the blow, gripped the wrist, twisted, turned, and suddenly brought the trapped limb down hard against his shoulder. Normally that would have broken the arm, would have snapped it at the elbow and left Jay crippled and helpless, but Sam was up against no normal fighter.

Jay leapt up and forward as Sam turned and, just as he felt the pressure being applied to his elbow, the fingers of his right hand curled beneath Sam's chin, probed for a moment at the knotted muscles of the throat, then dug in with savage viciousness.

The rest was merely for the benefit of the crowd.

It was butchery, cold, calculated, and serving both to cover up the effects of the nerve-blow and to vent Jay's own hate and rage. He slammed his fists against Sam's face and head, opened a cut over one eye, split his lips and, with one final blow to the jaw, finished the unequal combat.

He walked towards the referee leaving the duelist unconscious on the reddening sand.

"A good bout," complimented the referee. "I thought that you'd be in trouble there. Aldway's a nasty fighter, but you handled yourself well." He picked up a red-tipped stylus. "Hold out your arm."

Silently Jay held out his left forearm for the referee to brand him with the red dot. It was a nuisance, but he could have it removed at Medical, and to protest would be to arouse suspicion. He was donning his sandals when someone called to him.

"Jay! I didn't think that you went in for duelling."

It was George Curtway and the sight of him brought back all the unaccustomed indecision which Jay had managed to rid himself of in the arena. Slowly he fastened the catch of his sandal.

"So it was Sam Aldway you were fighting." George stared down at the pale face of the duelist as he was carried out by the attendants. "You want to watch him, Jay. He'll never forgive you for beating him. What happened?"

"He wanted to pick a quarrel," said Jay shortly. "He picked on me and I was lucky enough to win." He crossed to the water spray and washed the blood from his face. "Busy, George?"

"Just come off-shift. We had a sticky job up in low-weight, condensation in the junction boxes, but I'm free now." He hesitated, looking at Jay as if he had something on his mind then, as the young man straightened from the water-spray, touched his arm. "Look, Jay, there's something I've been wanting to talk to you about. Are you free now?"

"Yes." Jay dried his face and hands in the warm-air blast. "What is it?"

"I'll tell you later." George stared at the people around them, the attendants, the few couples waiting to take their turn in the arena, the inevitable crowd hanging around eager to catch a glimpse of some battered form as it was taken to the infirmary. "It's too crowded here. Have you eaten yet?"

"Yes."

"That's a pity. I'm starving and we could have eaten together." George frowned. "Tell you what. Meet me in my cubicle, you know the one. There's a viewer there so you won't be bored and I'll join you as soon as I can. Right?"

Jay nodded and, leaning against the wall, watched the electronics man thrust his way through the crowd around the stadium and turn down a corridor. It was luck that George Curtway should have been there. The man he was looking for had found him first, had even arranged a rendezvous for his own death, though he couldn't know that. Jay should have been pleased but somehow he felt even more despondent than before. He started as a man touched his arm.

"I watched you in the arena," said the man thickly. "A good, fast bout. Want to try another?"

He was still young, scarred a little, wearing the maroon shorts of sanitation and with the inside of his left forearm dotted with the red marks of previous duels. Looking at him Jay recognised the type, a natural-born fighter, a man whose greatest pleasure was in pitting his strength and skill against those of others. Jay shook his head.

"Sorry, but no."

"A pity." The man shrugged, not annoyed at the refusal but vaguely regretful at a lost opportunity. "No need to make it a death-bout. Just a friendly combat to work off some energy." He looked hopefully at Jay. "Yes?"

"No."

"Some other time then? I'm always to be found here when off-shift."

"Perhaps." Jay watched him move among the crowd waiting for seats in the stadium, pausing now and again to offer himself as a partner in a duel. Jay was amused at the man's sincerity and mentally com-

pared him to Aldway. Sam was dangerous and would have to be eliminated before making too big a nuisance of himself. The other was an integral part of the economy of the Ship.

Jay sighed and made his way towards Curtway's private cubicle.

IX.

Quentin, Captain of the Ship, sat at the head of his desk and stared at the men sitting before him with amusement tinged with contempt. They were so obvious, so transparent, so—young. Conway, swollen with his own importance at being in charge of Psycho. Henderly, jealous of the psychologist and yet conscious of his own superiority. Malick, chief of Genetics, the little God of a little world. Gregson, hard and implacable, cold and ruthless, toying with intrigue and insanely envious, not of the Captain, but of what he represented. Folden, chief of Supply.

The hierarchy of the Ship.

Quentin let them sit in silence for a while, calm in the knowledge of his own superiority, and yet, even as he sat, his eyes were never still. Old those eyes might be, but they had lost none of their sharpness, and they saw far more than any of the men before him imagined. Quentin was no fool.

He rustled the thin papers on his desk, selected one, scanned it more for appearance than for any real need to remind himself of what it contained, then dropping it, stared at Gregson.

"Any further news on the elimination of the Barbs?"

"None." Gregson scarcely troubled to disguise his impatience. "As yet three schemes have been submitted to me for approval. All are verging on the ludicrous in their total disregard of facts. I can only assume that the originators of the schemes must be trying a feeble joke at my expense."

"I submitted one of those schemes," said Henderly harshly. "What was the matter with it?"

"The same as with all of them." Gregson shrugged at the medical officer's expression of anger. "Of the three, two advocated the offer of amnesty to the Barbs if they would return to their sectors. I need hardly emphasise the stupidity of that suggestion. They know full well what will happen to them if they agree to return. The third contained some wild scheme to electrify the stanchions and girders of No-Weight."

"That was my suggestion," said Conway. "What's wrong with it?"

"Better ask the electronic engineers that. I did. They tell me that, even if it were possible to divert sufficient current to No-Weight to send a lethal voltage through the fabric, it would be impossible to insulate it from the rest of the Ship without extensive alterations."

"I see." Quentin spoke before Conway could express his anger at the sneering tone of contempt Gregson had used. "I assume, of course, that you have a better suggestion?"

"I have."

"May we hear it? Or does the chief of psych-police consider that his Captain is too stupid to understand it?"

"Stupidity is a relative term," said Gregson stiffly. "Perhaps one of my officers would consider you stupid if ever you met him in the arena."

"If I was ever so unwise as to place myself in that position," said Quentin quietly, "then I would be something more than stupid. Your suggestion?"

"Seal No-Weight and search it from end to end with armed men given orders to kill everyone they find." Gregson shrugged at their instinctive recoiling from the use of weapons. "If you don't like to arm the men, then I have another plan. Seal the area just the same and flood it with lethal gas. Exterminate the Barbs for the vermin they are."

"And how would you get rid of the gas afterwards?" Quentin gestured for Folden to remain silent. "Have you considered that?"

"Chemistry isn't my department. Is it possible to use a neutralising agent for the gas? Or perhaps we could withdraw the poisoned air and replace it with fresh?"

"No to both suggestions," said Folden impatiently. "We know of no such neutralising agent, and to evacuate the air would be criminal waste."

"Justifiable waste."

"Criminal," insisted Folden. "We could replace the air, yes, but to evacuate anything from the Ship would be to disturb the ecology. I must veto any such suggestion."

"Why not arm the searchers, then? Or would that be criminal waste too?" Gregson glared at the chief of supply, sarcasm heavy in his voice.

"What would you arm them with, Gregson?" Quentin's voice, though calm, had a peculiar carrying quality. "Knives? Clubs?"

"Guns, of course, what else?"

"I take it that you mean high-velocity pistols. Have you ever fired one?"

"You know that I haven't. No one has. Weapons are forbidden aboard the Ship."

"Exactly, and for a very good reason." Quentin sighed as if finding the explanation tedious. "First, even if you had one, I doubt if you could hit anything with it. Before a pistol can be used training and practice are essential. Second, even if you could use them, I would never allow them to be fired within the Ship. The damage they would cause to the structure would be worse than tolerating the Barbs. You seem to have no idea of the impact-force of a bullet and certainly none of the vulnerability of the Ship itself. No, Gregson, I cannot accept either of your suggestions."

"Then what are you going to do, let the Barbs alone to raid the farms and laugh at us?"

"The Barbs are a minor nuisance and any plan which necessitates too great an expenditure of time or material would be defeating its own end. However, Henderly has a plan which I am considering and which may lead to their successful elimination. Incidentally, Gregson, I shouldn't have to remind you that the very existence of the Barbs is proof of your own inefficiency."

"Twenty people have fled to No-Weight during the past ten years," snapped Gregson. "That is less than two percent of the total disposable population during that time. I would hardly consider that inefficient."

"You are at liberty to think as you wish." Quentin selected another paper from the litter before him. "Malick! Your report on population disturbs me. Explain."

"We are reaching saturation point," said the saturnine-faced chief of genetics. "As far as possible we have managed to avoid inbreeding by shift of personnel and rigorous mating control. However, as time passes, it is getting more and more difficult to select suitable partners for the new generation. Some inbreeding has become inevitable, and more will be necessary during future years."

"Is that bad?" Henderly leaned forward, his eyes bright with professional interest. "Surely the inferior strains have been eliminated by now?"

"Naturally, but there is always some danger in inbreeding, the possibility of atavism is higher than normal and certain nervous disorders can be expected if we continue as at present."

"I don't understand this." Folden stared at the chief of genetics. "As far as I can see inbreeding is unavoidable. Didn't the Builders take all that into account?"

"They did."

"Then what's the trouble?"

"The trouble is simply one of time and circumstance." Like Quentin, Malick seemed tired of having to explain. "The Builders determined, quite rightly, that in order to keep the race healthy we must concentrate on youth, not age. As far as the Ship and Genetics is concerned a man or woman has served the purpose of their existence as soon as they have mated and given birth to children. We are only interested in the new generation, the old merely serve to maintain the Ship and are expendable as soon as others grow to take their place." He glanced towards Gregson. "You know all about that and you also know that Psycho determines the population figures and personnel for elimination on the basis of general unfitness or sheer need of living space. So many new births allowed per year, therefore so many deaths necessary to make room for the new life."

"One hundred and thirty new births per year," said Gregson. Partly because he didn't like being ignored and partly to show his own knowledge. "Of the necessary deaths about a half are eliminated by duelling. The remainder are taken care of by my officers." He shrugged. "It works out at about a death a month per sector."

"What has that got to do with inbreeding," snapped Conway impatiently. "What are you getting at, Malick?"

"Simply this. As all female personnel are automatically sterilized when leaving marriageable status, we are confined to a very limited age-group for breeding purposes. We have young parents, they mate at optimum age, but we are unable to use the same parents more than once. In other words a boy marries a girl, gives her children, and then is prevented from entering into a fruitful marriage with a second woman." Malick shrugged. "We have bred for optimum characteristics, of course, and have managed to breed out all hereditary disease, mental instability, and certain undesirable physical deformities. We have bred a race of highly intelligent, physically perfect men and women, but in so doing we have also given ourselves a first-class problem."

"I begin to see what you're driving at," said Henderly. "Nervous potential?"

"Exactly. They appeared to have had the same trouble back on Earth when they were toying with the breeding of racehorses. They bred for speed at any price, and wound up with walking bundles of nervous tension almost impossible to control. There is nothing basically wrong in selective breeding if the original stock is sound. The trouble starts when you breed for certain characteristics. We have bred for an adventurous type with a high survival factor and amazingly fast reflexes. We have got that, but we have also got what goes with it."

"Don't you trust Psycho?" interrupted Quentin softly.

"What?" Malick blinked and stared at the Captain. "Of course I trust Psycho, but that doesn't prevent me from asking myself what is going to happen next. What is the good of breeding an adventurous type when there is nowhere for them to go adventuring? How can we control highly-strung, sensitive-nerved men and women when they are surrounded by a limited existence almost calculated to drive them into a frenzy of frustration?" He almost seemed about to burst into tears as he asked the questions. "I'm not questioning the Builders, obviously they knew what they were doing, but to me it seems all wrong. The Ship isn't the place for the type of human we've bred. We should have gone in for morons, dull-witted clods who would be content to eat and sleep and mate like the animals they would be. You can't give a man a keen brain and a perfect body and then prevent him from using them. Not if you want to avoid trouble you can't."

"Calm yourself, Malick." Quentin smiled with quiet satisfaction as the chief of Genetics relaxed. "That's better. It is foolish and a waste of energy to torment yourself with questions of what may never happen." He picked up and scanned another of the papers before him.

"Conway, are you satisfied that everything is normal with Psycho?"

"Of course it is, why shouldn't it be?" The automatic defence of the psychologist almost made the old man smile. "Nothing is wrong in my department."

"Are you certain of that?" Quentin stared at Conway with peculiar intentness. "Something in your report makes me wonder. There is a slight alteration in the ratio between permissible births and recommended eliminations. Have you noticed it yourself?"

"Oh, that?" Conway dismissed it with a shrug. "Simply explained. The incidence of duelling has risen during the past few years, probably due to the very thing Malick has been telling us. Naturally, as there is more room for new life the number of permissible births has risen also."

"Does that also account for the reduction in the number of recommended eliminations?"

"What else?" Conway seemed genuinely amazed at the question. "We remove the cards of those killed in duels, you know, and Psycho automatically allows for them."

"That would hardly account for the fall," reminded Quentin. "The fact that several deaths have occurred from duelling would not alter the fact that others would be considered unfit by Psycho. Old men, for example, those who have reached their fortieth year."

"Perhaps," said Conway doubtfully. "I hadn't thought of it like that."

"I can't see that it makes any difference," said Gregson. "We have to eliminate about a hundred and thirty men and women a year. The fact that more of them are being killed in the stadium doesn't alter the fact. It only makes the job of the psycho-police a little easier."

"Of course." Quentin rustled his papers again, apparently accepting the explanation. "Your report interests me, Folden. I will discuss it with you later, after I have had time to check certain details."

"My report of the supply position?" Folden looked at the Captain. "I've already checked everything possible and the inference is plain. Normal wastage has reduced our potential to a disturbingly low figure. I . . ."

"I said that I will discuss it with you later." Quentin silenced the chief of supply with a gesture, conscious of the open in earnest of the others. "Have any of you anything further to say at this meeting?"

"The tapes," blurted Malick, then stopped as the others stared at him.

"Yes?" encouraged Quentin. "You were saying?"

"I don't know if my memory's bad, or whether the tapes now shown on the children's screens are different to what they were, but I can't make sense of them." Malick stared a little helplessly at the incredulous faces of the men around him. "I know that the educational tapes are routed to the various sectors and sub-sectors by Psycho, but to me it seems that they are totally at variance to what is normal."

"How do you mean?" said Quentin sharply. "Explain yourself."

"Well, you know that we've always had tapes showing scenes of old Earth, the idea being, I suppose, that the children would remember the planet of their origin. But now those tapes seem to be in far greater detail than ever before. There are entire sequences of growth and decay, the balance of insect life to animal, the interplay of flora and fauna. There have even been scenes of the actual trapping and butchering of animals for meat!" Malick shuddered. "They were disgusting! Who, in their right mind, would ever consider eating meat anyway?"

"You might," said the Captain gently, "if you were starving and meat was the only edible food."

"The only meat aboard the Ship," said Malick tightly, "is the personnel. Are you advocating cannibalism?"

"I advocate nothing, I merely answered your question. And you are quite wrong in your statement. There is meat aboard the Ship other than the men and women you have bred."

"I don't count the animals in deep-freeze," snapped Malick irritably.

"They are in the sealed areas, apart from the Ship proper."

"They are still meat, just the same."

"That has nothing to do with it. Those tapes are contaminating the minds of the young and they should be stopped." Malick stared accusingly at Conway. "You are in charge of Psycho. Why don't you get the electronic engineers to check it over and make sure that nothing has gone wrong?"

"Nothing is wrong with Psycho," insisted Conway. He glared at the chief of genetics. "If you ask me it's you that is wrong, not Psycho. Maybe you'd better let Medical make certain that your 'highly-strung nerves' haven't sent you over the edge."

"I don't have to listen to that kind of talk from you." Malick jerked to his feet, his face red with anger. "If you're a man at all you'll meet me in the Stadium and . . ."

"Control yourself, Malick!" The Captain didn't raise his voice but something in the thin, penetrating tones chilled Malick's anger. "You are overwrought or you would never have dared to challenge a fellow-member of the Council. Sit down and calm yourself." He waited until Malick had resumed his seat. "Now, let's look at this thing intelligently. You know perfectly well that all educational tapes are channelled from Psycho on automatic relay. No one could have touched them and, if what you say is true, then it must be as the Builders intended. Are you questioning the wisdom of the Builders?"

"No." Malick looked uncomfortable. "Of course not."

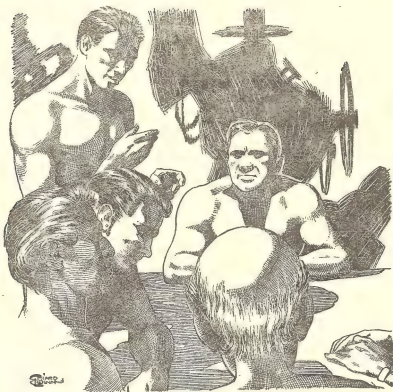
"A pity. It is possible to place too great a reliance on the work of others." Quentin stared down at his papers for a moment then rose in dismissal. "That will be all, gentlemen. I suggest that we each concentrate on our duties and waste no time in idle speculation."

He stood by the head of the desk as they left the room. Tall, proud, almost fatherly in the way he stared after them. Alone, he sat down and, closing his eyes, let his mind and thought mingle with the eternal, sub-audible vibration of the Ship which was his universe.

It was happening again.

The same old distrust, intrigue, the playing for power and the breaking out of ambition. The envy, pride, jealousy and, above all, the mind-wrenching fear of what was to come. The hierarchy knew too much for their peace of mind. They were no longer young and, knowing what they did, they would fight against elimination with every weapon at their command. Quentin recognised it. Had recognised it for some time now and knew that in sheer self-defence if for no other reason he must protect himself. For there was only one man in the Ship who was safe against the dictates of Psycho, and that man was the Captain.

Opening his eyes he pressed a button on his desk and waited for the intercom to warm into life.



"Yes, sir?" His private aide. The one person he could trust in the entire Ship. Someone unknown to the rest of the hierarchy and all the more valuable because of that. Quentin lowered his voice as he spoke into the instrument.

"Find Merrill and send him to me. Use caution."

"Naturally, sir."

The intercom died as the Captain broke the connection. He stared at it for a moment, his mind busy with plans then, resting his head between his hands, he relaxed. His shoulders stooped, his muscles

grew limp and flacid, nerves and tendons sagged as he relaxed his iron control and his breathing rasped in his throat as he sucked in great lungfuls of air.

In that moment he looked very old.

X.

George was a long time in arriving. Jay sat in a chair and stared moodily at the illuminated surface of the viewer-screen hardly noticing the images flashed before his eyes. Habit had made him switch on the viewer, the same, ingrained habit that made everyone in the Ship turn to education as the main form of amusement. But he found little to amuse him in the pictured representation of a dismantled radio-set. He leaned forward and was about to switch off when the door opened and George entered the room.

"Sorry to have kept you waiting, Jay. I got talking to another electronics man and forgot the time."

"Did you." Jay turned the switch and watched the screen flicker and grow blank. "What did you want to see me about, George?"

Curtway hesitated. Though he was older than Jay the difference was hardly noticeable and, as they stood next to each other, they could have passed for brothers.

"It's about Susan," he said awkwardly. "I hardly know how to say this without causing offence, Jay, but I wish you wouldn't see her any more."

"I see." Jay looked at the elder man. "You realise what you are saying, of course?"

"I mean no insult," said George hastily. "It's just that Susan is an impressionable girl and you're young and handsome. I'm not blaming you or anyone, Jay, but she's due for marriage soon and I don't want her to get into trouble with Genetics."

"Are you accusing me of immorality?" Jay deliberately encouraged his mounting temper. George was making things very easy for him. An accusation like that was sufficient ground for a challenge and, once he had George in the arena, the rest would be simple.

"No, Jay, you know that I wouldn't do that."

"Then what objection can there be to my seeing her?"

"She's in love with you, Jay. That isn't good, not when there can't be any future in it for either of you. Unless you agree not to see her you'll ruin her marriage and create discontent." George stepped forward and rested his hand on the other's arm. "Be reasonable, Jay. I know that you're fond of Susan, but think of her own good. Later, when she's out of marriageable status, there'll be plenty of time for you to settle down together."

"I don't like what you're saying, Curtway." Jay shook off the hand on his arm. "I consider that you've insulted me to an unpardonable extent. Naturally, you'll give me satisfaction."

"No, Jay."

"You refuse to fight?"

"Yes." George glanced at the red dot on Jay's forearm. "I'm no duelist, Jay, and I didn't think that you were either. If a father can't protect his daughter without fear of getting murdered by some arrogant bully, then there must be something wrong in the Ship. I don't think that you really mean what you say."

"You have accused me of immorality," said Jay coldly. "I demand satisfaction."

"You can't make me fight you, Jay."

"You admit to being a coward, then?"

"I'll admit anything you like. Call me a waster if you want to. Hit me if it gives you any satisfaction, but I'm not going into the arena with you or any other man." George smiled and deliberately sat down. "Now, let's be sensible, Jay. I know you too well to believe that you would take advantage of an old man like that."

He was right, of course, and Jay knew it. Nothing would persuade George to enter the arena and, despite his own urgency, Jay felt a little ashamed of trying to force a duel. Elimination should be quick, cold, utterly merciless and without mental or physical pain. To drag an old man into the arena and there butcher him for the benefit of the watchers, was pure sadism. He sighed and joined George on the bench.

"All right, George. I can't make you fight if you don't want to."

"And Susan?"

"I won't see her again if that's the way you want it."

"It would be best, Jay."

"All right, then. Forget it. The thing's over and done with."

"Good." George leaned forward to switch on the viewer and Jay knew that it was time for him to go. He sat where he was.

"Was that all you wanted to see me about, George?"

"That's all. Thanks for waiting to see me—and the other thing."

The other thing! Jay stared at the older man as he sat looking interestedly at the moving pictures on the screen. Jay could kill him now, a simple pressure on the carotids would do it, but killing wasn't enough. The death had to appear to be an accident and, glancing around the apartment, Jay knew that this was the wrong place.

"George."

"Yes?" Curtway blinked as he turned from the screen. "What is it, Jay?"

"I'm in trouble, George, and I wonder if you could help me."

"Trouble?"

"Yes. I was up near No-Weight a while ago, checking the ventilation tubes, and I spotted something I should have reported." Jay shrugged. "It slipped my mind during the fight and I'll be downgraded for time-lag if I report it now. It was in your department and I wondered . . ."

"Something to do with electronics?"

"That's right. One of those big, flat boxes, the ones with all the conduits leading from it. I noticed one smelling of burning and when I touched it I got a shock."

"Probably a short due to condensation," said George promptly. "We've been having a lot of trouble with the junction boxes lately." He looked at Jay. "What do you want me to do?"

"I was hoping that you could fix it and save me trouble." Jay made himself appear nervous. "If it goes through normal channels I'll be slated for delay and, if I ignore it, they might even send me to sanitation. If you could fix it for me . . ."

"Up near No-Weight?" George frowned. "Tell you what, Jay. I'll take a look at it and, if I can fix it, I will. Fair enough?"

"Thank's," said Jay gratefully. He rose and stepped towards the door. "Let's get it over with. I'm frightened less someone else should spot it and report in."

George sighed and followed him into the corridor.

As usual the area around No-Weight was deserted. Jay led the way among a tangle of girders, slipped into a narrow tube-like corridor, and paused by one of a number of junction boxes. George, manoeuvring awkwardly in the almost total absence of weight, joined him.

"Is this the one?" He didn't look down at the box.

"I think so." Jay stooped over it, touched it, then jerked back his hand as though he had received a shock. "This is it, right enough. Take a look at it, George."

"All right." George kicked himself forward and, like most people unused to free fall, kicked too hard. Jay caught him as he passed and drew him to where George could grip a stanchion.

"Thank's." The electronics man stooped over the box. "Now let's see what the trouble is."

He was wasting his time, of course, and Jay knew it. There was nothing wrong with the box at all, but it had served as a pretext to lure his victim to a place where his death could easily be accounted for. Looking at the man Jay felt a strange reluctance to finish the job and annoyed with himself for his hesitation, he moved in to make an end.

It would be simple with the simplicity of long practice. Pressure on the carotids, the great arteries of the throat leading to the brain, would bring swift unconsciousness. Continued pressure would bring painless death. Jay knew the exact spot where they lay beneath the skin. He knew just how to hold his victim so that any struggles would be useless. It would be routine, nothing more and, as he reached forward, he forced himself to ignore everything but his duty.

"Are you going to kill me, Jay?"

It wasn't so much what George said that shocked Jay into immobility, as the assumption of knowledge behind the words. He stood, swaying a little from the absence of gravity, and stared incredulously at the calm face of his intended victim.

"I've been expecting this," continued George evenly. "I guessed what you intended as soon as I saw the box. There's nothing wrong with it, and you know it."

"You refused to fight," stammered Jay desperately. He knew that at all costs he must keep the truth away from the other man. "You insulted me."

"That isn't why you wanted to kill me. Did Gregson send you?"

"Gregson?"

"Yes, Gregson, the chief of psych-police." George rested easily against the stanchion, his eyes serious as they stared at the young man. "I'm not a fool, Jay, and I've suspected you for some time now. You worked at odd hours, seemed to be missing for long periods of time, and didn't appear to have any particular duties." George shrugged. "I wouldn't have noticed it, I suppose, but for your attachment to Susan. I couldn't understand why, if you were young enough, you weren't married. That made me wonder. The final proof came when I saw you at headquarters one shift."

"You saw me there?"

"Yes. I had been to service Psycho, I'm a top-line electronic engineer, you know, and they trust me to service the machine. I took a short cut back to sector five and passed P.P. headquarters. I saw you there—and you weren't wearing red shorts."

"You fool!" Jay shifted his grip on the girder next to him in readiness for a lunge at the other man. "Don't you realise that you've signed your own death warrant?"

"Gregson did that for me a long time ago." George stared contemptuously at the young man. "Don't try anything, Jay. I'm ready and warned and I've had practice in free fall." He shifted as he spoke and Jay could see that his previous awkwardness had been assumed.

"Listen, George," he said desperately. "Let's be reasonable about this. There's nothing personal about it, you know that, but I've got to kill you. If I don't, then I'll be eliminated for failure of duty."

"Do you know why you were ordered to kill me, Jay?"

"No."

"Then I'll tell you. I found out something about Gregson. I tried to get a private interview with the Captain to tell him what I'd learned but he refused to see me. Gregson knows now that I know what he did. To safeguard himself he has ordered my death. That's the truth of the matter, Jay. Do you still want to kill me?"

"I must. Believe me, George, I'd rather do anything than eliminate you, but the welfare of the Ship depends on it. You don't understand."

"I understand well enough, Jay. I told you that I was no fool. I've eyes to see with and a mind to think with and a brain to correlate the resultant data. I know, for example, that there is no natural death aboard the Ship."

"You're wrong," insisted Jay sickly. "People die in Medical."

"They die, yes, but from what? Injections, perhaps? Wounds received in the arena? How many people have died of old age, Jay? Can you answer that?"

Jay could, but he didn't dare. The answer was that not one person had ever died of old age. They had never been allowed to live that long. 'Accident,' duelling, strange relapses all had accounted for every death since the Ship had left Earth so long ago. Senility, white-hair, thin and doddering men and women were incomprehensible to the Ship's personnel. Old age was something which just didn't exist.

"If you live," said Jay thickly, "you will be robbing a new-born child of its air and water, living space and food." He moved a little nearer to the older man. "You've had your time, George. Now you must die so that others can have their chance of life."

"I don't mind dying," said George calmly. "I'm intelligent enough to realise the necessity, and life isn't so wonderful that I should want to cling to its every moment. But is it fair that I should die while others cheat their turn?"

"Cheat?" What do you mean?" The accusation shocked Jay even more than Curtway's knowledge of what he was and what he did. "How could anyone cheat?"

"There is a way, if you're in the right position to manage it. Gregson is in that position, Jay. I know what he did and he knows that I know." George took a step forward. "Can't you see the danger, Jay? If one man can avoid his turn for death, then so can others. How long will it be before the Ship is a despotism ruled by a selected handful of old men?"

And that was the trouble. While elimination was fair for all then no intelligent person could argue against his turn. Not that they were

given the choice. No one could be expected to remain wholly sane while he lived from shift to shift in anticipation of a death-hour decided before his birth. Such knowledge would disrupt the routine of the Ship and convert its smooth-running system into a shambles. The old would demand rigid birth control so that they could live a little longer. The young would be frustrated at the thwarting of their natural desire for children. A gap would arise between the generations with the resultant loss of sympathy between age and youth. Such a system would lead to racial sterility, degeneration, and collapse of moral fibre.

Which was why the psych-police were among the most carefully selected personnel on board, trained and indoctrinated from early youth to accept the twin burdens of responsibility and silence. But if what they had been taught was a lie . . .

"You're wrong," insisted Jay desperately. "No one would be so immoral as to cheat like that."

"You think not?" George shrugged. "I'm an old man, Jay, and to the old life becomes a precious thing. To you death is something utterly remote, even though you know full well that one day someone will eliminate you as you tried to eliminate me. But when you get old you sense things. You have more time for thought and you begin to realise all the things that you've missed in life. You want to hang on, Jay. You want to cling to life as a newly-wed wants to cling to his bride, or as a mother to her first-born. You can't be logical then. You can't value and accept what must be. No. You want to live—and you'd do anything for a few extra years of existence."

"Gregson is old," said Jay thoughtfully. "I hadn't realised it before."

"Gregson is afraid of death," said George. "I know that." He took another step forward and touched Jay on the arm. "What are you going to do, Jay?"

"I don't know. I've orders, you know what they are, but if what you say is true . . ."

"It's true."

"Then you must see the Captain."

"How?" George shrugged with unusual cynicism. "I've already tried to get a private interview with the Captain. My request was refused. To try again I must pass my request through the psych-police. I'm supposed to be dead. If I make the application then Gregson will set his dogs on me again." He looked at Jay. "Can you suggest something?"

"I don't know," said Jay miserably. "Obviously you'll have to hide until a chance comes for you to see the Captain. If Gregson ever

finds out that I've failed to eliminate you he'll order my own death for inefficiency, so, in order to cover up, I'll have to fake your accidental death." He bit his lips in indecision. "You could hide out in No-Weight, I can smuggle you past the guard, but the accident . . ."

"How did you intend explaining my death?"

"Simple. I was going to kill you and then dash your head against a stanchion. The official verdict would have been that you had misjudged your speed and distance and crushed your skull on landing." Jay shrugged. "That idea's no good now. Merrill will investigate and, unless your 'body' is unrecognisable, he will guess at what I've done." Jay held out his hand. "Give me your identity disc and shorts."

"Why? What are you going to do?"

"I don't know yet, but I'll think of something." Jay snapped his fingers with impatience. "Hurry."

Reluctantly George stripped off his blue shorts and struggled to remove the stamped-metal identity tag from his wrist. He swore as he scraped skin from his knuckles but finally managed to get it off. He handed it to Jay.

"Now what?"

"Now you hide in No-Weight. I'll try to smuggle you up some food and water but don't worry if I don't come for a while. You won't stay there long, anyway. The quicker I can arrange an interview with the Captain the better."

Silently Jay led the way along the winding tube, drifting lightly from stanchion to stanchion, pausing just long enough to impel himself in a new direction and twisting his body with expert ease to cushion the shock of landing with his knees and thighs. Finally he paused at a sunken panel.

"This is an emergency entry into No-Weight. It's kept locked from this side and I'll have to fasten it behind you." Jay spun a wheel and jerked the metal slab open. "Right, George. In you go. Try to stay close to the panel if you can. When I bring you supplies I don't want to have to waste a lot of time."

"I understand." George stepped towards the opening and peered into the dark interior. He shivered a little. "It's cold in there."

"The converters are colder," snapped Jay impatiently. "Hurry."

George nodded and stepped through the opening into the vast cavern of No-Weight. He caught hold of the edge of the door and looked at Jay, his head a pale blob against the darkness behind him.

"What about Susan?"

"Susan will believe that you are dead." Jay glanced uneasily down the corridor. "To her, as to everyone, you will have met with an unfortunate accident." He softened as he swung shut the door. "I'm sorry, George, but there's nothing else I can do."

"No," said George slowly. "I suppose not." He hesitated. "Still, I'd have liked to say goodbye. Funny, that. No one ever thinks of it until it's too late to do anything about it." He removed his hand from the edge of the opening. "Take care of her, Jay. And thank you."

Jay didn't answer.

XI.

Merrill was afraid of the Captain. He stood before the wide desk, acutely conscious of the old man's scrutiny, and tried to assume an arrogance and recklessness he did not feel. Quentin smiled a little as he saw it, the tolerant, almost amused smile of conscious superiority, but he did not speak, just stared and allowed Merrill to feel the mounting tension. It was one of the oldest psychological tricks known, so old that it always worked. Merrill spoke first.

"You sent for me, sir."

"Are you ambitious?"

"I . . ." Merrill blinked at the unexpectedness of the question, then, as he recovered, his eyes grew wary. "Yes, sir. I suppose that I am. Every man likes to do the best he can for the welfare of the Ship and . . ."

"You like to control men," interrupted Quentin and his voice held a subtle contempt at Merrill's protestations. "You enjoy the feel of power, the knowledge that you, even in a small part, control destiny." He leaned a little forward over the desk. "Tell me, do you like to kill?"

"I am efficient."

"Then you enjoy what you do." Quentin smiled and relaxed against the back of his chair. "Don't bother to lie to me, Merrill. I know more about you than you know yourself. You may know what you do and think that knowledge is sufficient. But I know why you do what you do, and that knowledge makes me your master." He let his thin voice fade into silence and his eyes grew bleak and distant. "Remember that, Merrill. Always remember it. I am your master. The moment you forget that—you die." There was no passion in the thin tones, no arrogance or self-convincing blustering. It was a cold statement of fact and, hearing it, Merrill swallowed.

"Yes, sir. I understand."

"Good." Quentin smiled for the first time. "Now to business. I have sent for you because, though you may not know it, I have studied you for several years now and have decided that you are the man I need. Men grow old, Merrill, and you know what happens to them when age piles the weight of invisible years on their heads. Some men accept their fate, others . . ."

"Gregson," said Merrill, and stiffened in sudden fear. Quentin smiled.

"I knew that you were intelligent," he said softly. "But try not to be too intelligent." He leaned forward again, his elbows on the desk, his thin fingers caressing his throat. "We need mention no names and we need leap to no assumptions. I want a tool, nothing more, and a tool must be willing to obey without question or hesitation the dictates of its user. A time will come, maybe soon, maybe not so soon, when a job will have to be done. A man will have reached the end of his allotted span and, knowing that man, he may not be willing to yield his life and position. In such a case a tool must be used, a dumb, willing, obedient tool." The old man looked at Merrill. "You understand?"

"I do."

"Men are ambitious," said Quentin and seemed to be speaking more to himself than to the man standing opposite him. "Sometimes ambition can be dangerous, not only to them, but to those around them. Promises could be made and glittering prizes offered if . . . But there is only one man aboard the Ship who can really offer anything other than empty dreams. I am that man. Do as I say and you will have what you have won. Disobey me and . . ." He shrugged and looked directly at Merrill. "A wise man has many tools and relies on none. I trust that I have made myself clear?"

"Perfectly." Merrill tried not to smile at the prospect before him. "When?"

"I will tell you when. Until then you will obey your orders, say nothing, think nothing, and, above all, do nothing." Quentin rose in dismissal. "You may go."

He watched the young man stride from the room, his departing back radiating his arrogance and anticipation of what was to come and, watching him, Quentin almost felt pity for his blindness. Merrill was a killer, nothing more, and his usefulness ended there.

But he didn't know that.

From the Bridge Merrill was conducted down a hidden passageway towards his own sector and walked the droning corridors with his mind full of what he had just heard. The old man wanted him to

stand ready to eliminate Gregson. That was obvious and equally obvious was the fact that he would take over as chief of psych-police. Merrill smiled as he thought about it. The job itself was worth having with the attached privileges of private rooms, a seat on the Council, and literal life and death power over every man and woman in the Ship. But it meant more than that. Once in power Merrill intended to stay there and, knowing what he knew of the system the Captain apparently used, he would make certain that no one ever took over his job.

Two could play at the game of assassination.

He was still living in a world of his imagination when he felt a hand on his arm and turned to stare at the sullen features of Sam Aldway.

"What do you want?"

"I want a talk with you." Sam glanced over his shoulder. "Let's go somewhere private."

Merrill hesitated for a moment then, looking into the face of his dupe, led the way to a common rec-room. Closing the door behind them he tripped the 'engaged' signal and glared at Aldway.

"Well?"

"I took him into the arena," muttered Sam. "You know who I mean."

"So he agreed to fight?" Merrill smiled. "Good. I never thought that he would. You killed him, of course."

"No."

"No?"

"I didn't kill him, in fact he almost killed me." Sam fingered his bruised throat. "Even now I don't know just what he did. I had him, another minute and he'd have been ready for the converters, and then the lights went out and the next thing I knew was the attendants standing over me." He winced as he touched the transparent plastic over his eye and lip. "You should have told me that he was up to all the tricks. Hell! I thought that he was just a neo."

"Would I have trained you in that case?" Merrill stared at the man with undisguised contempt. "So you failed. For all your boasting you let a first-timer beat you up and make a fool out of you." He shrugged. "Well, you've had your chance."

"Wait a minute." Sam grabbed at Merrill's arm as he stepped towards the door, then yelped as a stiffened hand slashed at the inside of his elbow.

"Keep your paws off me." Merrill glared at the hydroponics worker as if he could have killed him. "How dare you touch me!"

"I'm sorry." Sam massaged his tingling arm. "What about that job you promised me?"

"I promised you nothing. I merely told you that I couldn't have two assistants at the same time, but even that doesn't matter now. You've had your chance and failed. I've no time or patience with failures." Merrill stepped towards the door and stood, his hand on the latch, looking at the other man. "Forget it, Aldway. Stay at your job and keep out of trouble. I can't help you now."

"Wait!" Sam stared desperately at the cold face of the officer. "I can try again. I . . ."

"He'll never let you get him into the stadium a second time. Even if you did he could beat you just as he did before, and this time he might kill you in order to get rid of a nuisance." Merrill lifted the latch. "Sorry, Sam, better take my advice and forget it."

"I can't." Sam looked ill as he thought about it. "I can't spend the rest of my life tending those damn plants. I won't do it." He stepped forward his eyes appealing. "Look. Supposing he dies. Never mind how but supposing he does. Would I get his job?"

"Maybe." Merrill pretended to think about it. "Unless, of course, you were arrested for murder and sent to the converters."

"I'll take that chance," said Sam eagerly. "Well?"

"If he dies," said Merrill slowly, "I'll be needing a new assistant." He opened the door. "It's up to you, Sam. It's all up to you." The door closed behind him and Sam smiled.

It wasn't a nice smile.

He sat in the room for a while his mind busy with unaccustomed thoughts. To kill was easy, or so at least he had always thought, but to get away with it was the important thing. The alternative was the converters or, if he took Merrill's advice, a lifetime of menial labour in the farm. Thinking about it made him feel sick and, as he blamed Jay for his position, he began to hate where before he had only been contemptuous. By the time he left the room he was boiling with rage and almost frenzied in his desire to kill the man who stood between him and his ambition.

A couple passed him as he entered the corridor, both fully mature, the woman wearing the dull beige of the kitchens and the man the grey of waste reclamation. The woman stared at him and moved towards the vacated room. The man glanced at Sam's passion-distorted features and laughed before following the woman into the rec-room.

Sam paused, his hands knotting at his sides, fighting the desire to hammer on the door until it opened and then to smash the laughing face into pulp. He tried to control himself. There would be time enough for vengeance later, more time than he would need, and the



training which Merrill would give him would make victory all the easier. But first he had a job to do.

He went looking for Jay.

He found him in one of the transit passages leading down from the upper levels and, cursing the people thronging the crowded corridor, began to stalk his victim like the blood-crazed beast he was. Instinctively he took care that he should not be seen and, with an effort of will, managed to control his features so that to a casual watcher he would appear to be intent on his own business. His experience in the arena had taught him that the young man was dangerous, too dangerous for fair fight, and as he followed the figure in the red shorts, Sam began running over the tricks Merrill had taught him.

Jay was totally unaware of the man behind him. He had his own worries and, as he turned from the busy passage into a quieter, more deserted region, he began to regret having helped George escape to No-Weight. It had been easy to talk of plans but carrying them out was something else. He frowned as he touched the folded blue shorts beneath his own red ones and his eyes, as he walked along, were never still. He had to find a man to take Curtway's place. Had, in effect, to murder an innocent stranger so that someone could snatch a few more weeks of life. At first he had viewed the scheme with cold detachment but, as time passed, he felt a growing reluctance to do what was necessary.

Operating under orders from P.P. headquarters was one thing, but acting as a free-lance was something quite different. In the first case he had no responsibility, no feeling of guilt or shame and he could take a quiet pride in an effective elimination as a job done efficiently and well. Now? He gritted his teeth as he tried to overcome his indoctrination and select a body with which to stage the 'accident.'

He paused before the door of Curtway's cubicle, saw by the external sign that it was empty, and walked inside. It would be better to have the body discovered in its own quarters, it would help identification for one thing, and for another it gave him time to set the stage. The 'accident' must almost completely destroy the body and, in all the Ship, the only way to do that was by electrocution. Grimly Jay squatted down beside a masking plate and began to undo the fastenings.

He barely heard the soft whisper of feet behind him as Sam lunged to the attack.

He half-turned just in time to avoid the full impact of the blow intended to snap his vertebra but even then the side of his neck went numb and darkness flooded his vision. Desperately he staggered to his feet, automatically twisting to avoid the knee thrust at his groin, and tasted blood as fingers stabbed at his throat. Again the searing, nerve-paralysing blows tore at his consciousness, sapping his strength and dimming his reflexes, so that he reeled helplessly against the metal wall, the hard surface bruising his cheek.

He could have died then, would have died if Sam had remained cool, but science yielded to instinct and Sam forgot what he had been taught in an excited frenzy. Instead of standing back and hitting with calculated precision he tried to hit too often and too fast. He slashed at barely seen targets, stabbed at spots not quite as vulnerable as others, beat with savage, but stupid energy at bone and muscle. He caused pain, the sickening pain of torn muscle and jarred nerve but, because of that very pain, he defeated his own ends.

Jay, spurred by his pain, shook off his numbness and fought back.

It was smooth and deliberate, the expert against the amateur, the professional assassin against the would-be murderer. Sam never stood a chance and, when it was all over, Jay was still only half-aware of what he had done. He leaned against the wall, mechanically massaging his tormented neck then, as he stared at the dead man at his feet, smiled for the first time since he had received his assignment.

The door was closed and the signal that would prevent anyone violating the advertised privacy in place. Quickly Jay stripped the brown shorts from the dead man and exchanged them for the blue ones he had taken from Curtway. The identity disc was a harder job and he sweated as he dragged it from the limp wrist and replaced it with the other. That done, he stooped over the masking plate and removed it from the wall, standing it against the bench before returning to peer into the cavity revealed.

Wires ran thick and heavy behind the metal of the wall. The triple circuits of the Ship, some for power, others for light, still others for the emergency illumination never used and only now assumed to be in existence. Jay frowned at them, wondering which would be the best for his purpose then, as he remembered another, similar case, shrugged and dragged the dead body towards the opening.

It would be a sloppy job. No electronic man in his right mind would ever allow himself to be electrocuted and the 'victim' was an expert in his trade. For a moment Jay hesitated, pride of workmanship struggling against sheer necessity then, thrusting forward the limp, right hand, he let it fall onto the bare connections.

The stench was awful. It was a blend of ozone and burnt blood, of charred flesh and scared metal. It was nauseating, vile and, as blue lightning tore across the widening gap between flesh and metal, Jay fought against the desire to vomit. He swallowed, desperately trying to quell his sickness, and stared at the blackened shape lying before him.

It had been human, male, had worn blue shorts and still carried a scrap of metal around the left wrist. That could be told and that was all. Satisfied, Jay rose to his feet and stepped towards the door. Somewhere a fuse would have blown and meters kicked. Watchers would report a power-drop and men would be sent out to investigate. They would find a dead man and an exposed wire. They would report it to Merrill who, because of his job, would state that the entire occurrence had been an accident. The men in olive would come to collect the remains, other men would repair the damage, and the thing would be over and forgotten.

Except for Susan's tears.

She would believe her father dead, but there could be no help for that. There could be no comfort, no whispered reassurances, no betrayal of what had really happened. George Curtway was officially dead—and Jay's life depended on everyone believing that.

He stepped out into the corridor, closing the door behind him, and strode along the passage. He felt dirty and his stomach heaved with the remembered odour of roasting meat. It seemed to cling all around him, to have permeated the very pores of his skin and to be attached to his hair and shorts. He wanted to strip and step into a spray-shower, to lave his body and wash away the stench, to stare at an educational tape and cleanse his mind. He didn't notice Susan until he bumped into her.

"Jay!" For a moment she clung to him then, remembering their last parting, moved consciously away. "Sorry, but it was really your fault."

"Forget it." He stared down at her. "Where are you going?"

"To see dad." She attempted to move past him. "Please let me pass, Jay."

"No." He took her arm and tried to make her walk with him.

"Let's go and watch a tape or something. I haven't seen you for . . ."

"Please!" Coldly she removed his hand, her nose crinkling as if she smelt an unfamiliar scent. "You seem to have a bad memory, Jay. I haven't."

Numbly he watched her walk away from him down the passage towards her father's cubicle. He wanted to stop her, to force her to come with him, to do anything to prevent her seeing the sight which soon she must see. But there was nothing he could do. Nothing.

He heard her scream as he left the corridor.

XII.

Gregson stood and watched the machine of destiny. Big it was, as it had to be to hold all the filed information, the various educational tapes, the selective master-plates, the cards, the erasers and computers. In itself it was a masterpiece of planning, constructed by the Builders centuries ago to serve as a guide and a master above and beyond all limitations of human flesh. The Ship could forget its purpose, the personnel waste themselves in ambition and selfish pleasure, the race sicken and die from stupidity and greed but Psycho would always be ready to give the information to restore the essential balance if the project of which it was a part was to succeed.

And yet it was not wholly omnipotent. It could advise but it still needed the human touch to transform its dictates into action. Looking at it Gregson felt a quiet pride in that he was one of the few elect. He turned as Conway came towards him.

The psychologist carried a thin sheaf of plastic cards, rejects from the file banks, now erased and ready for further duty. He dumped them into a hopper, threw a lever, and smiled as a man who sees the completion of a job well done.

"Fascinating, isn't it, Gregson?" Conway rested his hand on the metal casing of the machine. "Just think, inside here are the full details of every man and woman, child and new-born babe aboard the Ship. Every tiny detail, fed in fragment by fragment from Medical, Genetics, Supply, the Kitchens, the observers, all correlated and intermeshed by Psycho into a composite whole so that, at any moment, we can determine the efficiency-rating of anyone we wish."

"Anyone?" Gregson's expression matched the dryness of his tones. "The Captain?"

"Not the Captain, at least I don't think so." Conway looked disturbed. "He can't be, can he?"

"Not at his age he can't."

"Well, then, everyone except the Captain." Conway caressed the machine again. "The more you think about it, the more wonderful Psycho becomes. It selects and channels the educational tapes, determines the exact amount of all material aboard, maintains the temperature and humidity of the air, keeps . . ."

"It's a machine," said Gregson harshly. "Nothing more than an elaborate electronic device. Stop talking about it as though it was a God."

"I trust Psycho," said Conway mechanically. He looked over his shoulder at where an assistant worked at a desk, and lowered his voice. "Control yourself, Gregson. We may be observed."

"Quentin is no God either." Gregson stared at the smooth bulk of Psycho as though it were a human enemy. "He is an old man, too old."

"He is still the Captain."

"There were other Captains before Quentin," said Gregson deliberately, "and there will be others after him. How long must we let him live before making a change?"

"Are you insane!" Conway stepped forward, his eyes fearful as he stared around him. "If he should learn of this?"

"Why should he?" Gregson shrugged but when he spoke again it was in almost a whisper. "Relax, Conway. We are alone now and there is no need for us to pretend to each other. Is Quentin's card in Psycho?"

"I don't know. He's the only person in the Ship who does not wear an identity disc. His card may be filed with the others, but how can I tell? Without his number it would be impossible to find."

"It isn't in there, then," said Gregson with quiet certainty. "The first thing any Captain with sense would do would be to remove it. Quentin is no fool, he wouldn't be the Captain if he was, and no fool would have managed to stay alive so long." His eyes as he stared at Conway held a sick envy. "How old would you say he was, Conway?"

"Thirteenth generation?" The psychologist shrugged. "I don't know. How is an old man supposed to look, Gregson? I've never seen one to base an estimate on. Quentin could be thirteenth or even twelfth, but I'm only guessing."

"Say thirteenth," whispered Gregson. "That would make him anything between seventy-seven and fifty-eight years old." He licked his lips. "Twelfth? Twenty years more? Is it possible, Conway? Could a man live almost a hundred years?"

"No."

"Are you sure?"

"No I'm not sure," snapped the psychologist irritably. "How could I be? But the thing is against all logic. You heard what Malick said, a man's usefulness ends once he has fathered the new generation, and we know that Psycho determines the life expectancy at around forty years. The Builders set that figure, and the Builders knew what they were doing. After forty a man's efficiency begins to fall. Can you imagine what state a man would be in if, by some miracle, he managed to live that long? The concept is ludicrous."

"Perhaps you're right." Gregson seemed reluctant to dismiss the idea. "Put it at seventy then, or even sixty. That's still twenty years beyond the normal expectancy. A full generation!"

"For the Captain only," reminded Conway. "The rest of us still wear our discs and our cards are still filed in Psycho."

"Yes." Gregson stared at the humped bulk of the machine. "Of course. And at any time those cards could be sorted, rejected, expelled and sent down to me." He looked at Conway. "To the executioner."

"I know it." Conway shuddered at the unpleasant memory. "Every time I threw the trip-lever to expel the latest batch I wondered whether or not my card would be among them. Sometimes I couldn't stand the strain and had to call an assistant to take over. At others I'd snatch at each one, staring at them and, at each one I'd die and live again."

"But not now."

"No." Conway glanced at Gregson as a dog might lick its master's hand. "You ended that nightmare."

"Postponed it," corrected the chief of psych-police. "We still wear our discs and are still vulnerable to questions. Both of us are fourteenth generation. Neither of us is young. Others are watching us, my officers, your assistants, even the Captain. One day someone is going to ask some pertinent questions and when they do . . ." He shrugged.

"You'll take care of that," stammered Conway. "You took care of the other thing, didn't you?"

"I showed you what to do and you did it. Anyone but a fool would have thought of it for himself, but, even if you had done, you would still have needed me as I needed you." Gregson rested his hand on the machine. "Even at that we were discovered. An electronics engineer stumbled on something and requested an interview with the Captain."

"I remember that." Conway looked troubled. "What is going to happen?"

"Nothing, the man is dead." Gregson smiled with conscious power. "Didn't you expel his card for me. What else could I do but order his elimination?"

"So we're safe then." Conway sagged with relief. "Good. For a moment there you had me worried, Gregson, but with you controlling the police and with me in charge of Psycho nothing can go wrong." He frowned. "I wish that I could find out what it was that man discovered. If he found it then others could."

"Forget it. He's dead and if others ask too many questions they will die also." Gregson glanced around to make sure that they weren't overheard. "Our biggest danger is Quentin. I don't like the way he stares at me and I've the feeling he's up to something. I think that it's time we moved in."

"Mutiny?" Conway shook his head. "No, Gregson. I won't stand for that."

"Who said anything about mutiny? Quentin is old, and old men die. It happens all the time. If Quentin died then we'd have to appoint a new Captain. The only problem we have to face is who? Not Henderly, not Folden, and certainly not Malick. The man's almost insane as it is with his babble about tapes altering and showing meat-eating. You? How long would you last alone? No, Conway, I'm going to be the next Captain. Help me and your life is secure. Oppose me and I'll have to arrange an 'accident.'"

"I won't oppose you, but I won't help you mutiny either." Conway spoke with a lifetime of indoctrination against the concept of forceable overthrow of authority. "If Quentin should die, that's different. I'll stand by you as the new Captain."

"Yes," said Gregson drily. "After all, there's nothing else you can do, is there? As Captain I'd be the one man in the Ship to safeguard your secret." He stepped away as the assistant, apparently finishing his task, rose from his desk and came towards them.

"Well, Conway," he said for the others benefit. "Give me the cards and let me get on with the eliminations. I've still got the Barb problem to worry about."

"Any fresh news on that." Conway nodded to his assistant and reached for a lever, one of many on a panel before him. "Maybe it would be as well to let them alone. If Henderly is right . . ."

"Henderly is a fool. He under-rates the danger of starving men. He talks of cannibalism, and forgets that meat-eating is unthinkable to any normal person." His face darkened as he waited for Conway to throw the lever. "I've my own theories about the Barbs. I think that someone is feeding them, smuggling food past the guards in some way." He leaned forward as the psychologist tripped the lever. "I wonder how many this time?"

"Can't tell." Conway stepped beside him as he stared at the disposal tray. "The whole operation is automatic. Psycho is scanning the cards now for any which do not fit into the pre-selected master pattern. All unfit will be rejected." His voice warmed as he waited for the machine to finish its task. "It's really wonderful you know, Gregson. It's like building a new race on a previously determined matrix. Eliminate the unfit and save the essentials. Sixteen generations now of continuous breeding with the old making room for the young. All the erratic, the big-eaters, the work-shy, the mentally unstable, everyone in effect, who would create friction and discord if left alone."

"Then we must have a perfect race," said Gregson drily as he looked at the empty tray. "No rejects?"

"Not as many as there have been," admitted Conway. "I don't understand it, but Psycho can't be wrong." He smiled as two cards fell into the tray. "Two out of five thousand. Here." He picked up the cards, scanned them, and passed them to Gregson. "A woman, Julia Connors, Sanitation Sector Four and a man, Sam Aldway, Hydroponics, Sector Five."

"Again?" Gregson glanced casually at the cards. "Sector Five seems to be getting more than its fair share of eliminations recently." He shrugged. "We should worry, just so long as it isn't us, eh?" He laughed and, after a moment, Conway and the assistant laughed with him.

The assistant was the only one not genuinely amused.

Aside from the communications man and Carter the stand-by officer, headquarters was empty when Gregson returned. While waiting for Jay to answer his code signal he leaned back and, in the privacy of his office, surveyed his plans. Conway had been useful, might still be of some assistance, but, because of what he knew, would have to be eliminated as soon as Gregson had achieved his ambition. Malick too, the Geneticist was obviously irrational and, unless controlled, might cause later trouble. Henderly and Folden could continue on the Council for a while, but Conway would certainly have to be disposed of.

Merrill too.

Gregson was ambitious enough to take risks, but not fool enough to be blind to the ambition of others. Merrill was untrustworthy and a defence would have to be found against him. Jay West could be that defence, if unwilling, then against his knowledge. In any case it was foolish to tolerate too strong personalities around him. No man could rule longer than his companions allowed him to and, with ambitious men, any rule would seem too long. Gregson sat in his chair and hooded his eyes as he thought of the Captain.

Quentin was an old, senile fool—or was he? To the young all old men are fools for the young insist on mistaking caution for fear, cool-thinking for stupidity, tolerance for weakness. Quentin was old, fantastically old, sixty at least and maybe more, and he had been Captain for as long as Gregson could remember. But did mere age automatically qualify him for stupidity? Gregson sighed as he thought about it, then sat upright as Jay entered the office.

"You sent for me?" Jay looked tired. He had managed to get a spray-shower but still felt unclean. He doubted whether a full-water soaking for a good ten minutes would serve to wash away the lingering traces of the odour surrounding him.

"Yes." Gregson picked up the assignment card and threw it towards the officer. "Another job in your sector. The other one completed yet?"

"Yes." Jay stared numbly at the card and managed to control his instinctive reaction. Sam Aldway! The man he had planted to replace Curtway's missing body. The problem, instead of being solved, had only been postponed. He still had to find and eliminate an innocent stranger and, for a moment, he had a nightmare of continual assignments, each for the man he had just killed. He became aware of Gregson's eyes.

"Something wrong?"

"No." Jay returned the assignment card to the desk. "Why do you ask?"

"You looked odd. Sorry to keep you so busy but you know how these things are. They average out and you'll probably be bored to tears during the next few months."

"You think so?" Jay didn't respond to the friendliness in the other's voice.

"I'm sure of it. I remember one time when . . ." Gregson broke off as the door opened and Merrill entered the office. "What do you want? Didn't they tell you that I was engaged?"

"They did, but it can't wait." Merrill smiled with secret knowledge and stared at Jay. "You'd better change. You look better in red shorts."

"Change?" Jay stared at the hard face of the officer and felt his stomach tighten with apprehension. "Why? What's wrong?"

"You'll find out."

Jay hesitated then, at Gregson's curt nod, reversed his black shorts and donned them red side outwards. Merrill watched him, a faint grin of triumph lurking at the corners of his mouth, then jerked his thumb towards the door.

"Outside. There's someone out there who wants to see you."

"Hold it a second." Gregson stepped from behind his desk. "I give the orders, Merrill. Now, what's wrong?"

"Ask Jay."

"I asked you," snapped Gregson impatiently. "Don't get too big for yourself, Merrill. I suggest that you remember a conversation we had a short while ago."

"I'm remembering." Merrill didn't trouble to hide his enjoyment. "That's what makes this so sweet. Jay's bungled a job and managed to do it perfectly. He not only electrocuted an electronics engineer, in itself so stupid as to be incredible, but he did the job in the man's own cubicle and before a witness. I received the official complaint even before I had viewed the body. Name, time, place, everything." He smiled at Jay. "You must have really been trying."

"Shut up!" Gregson bit at his lower lip. "Did you bring the witness in quietly?"

"Quietly?" Merrill shrugged. "She was in the centre of a crowd when I arrived. Her brother, another electronics man, was with her and about a couple of dozen others. They all heard her name the accused and make the official complaint. Her brother swore that he'd make it his business to see that the killer was brought to justice. Get rid of the witness and you'll have every electronics man in the Ship asking questions, let alone trouble with Genetics for disposing of a marriageable female."

"Waste!" Gregson glared at the smiling face of Merrill. "Fetch the witness. And wipe that grin off your face too, this is a serious matter." He stared at Jay. "Curtway?"

"Yes."

"Is Merrill telling the truth?"

"I don't know," said Jay miserably. "I had to rush the job, that part is true, but . . ."

"But the man is dead?"

"Yes."

"I see." Gregson stood for a moment, his face bleak with thought. "You were a fool, West," he said dispassionately, "but maybe we can manage to settle this. Did the girl actually see you eliminate the man?"

"Of course not."

"Good." Gregson turned towards the door as Merrill accompanied by a woman entered the inner office. "My officer informs me that you wish to make an accusation," he rapped. "Is that correct?"

"It is." Susan stared with tear-swollen eyes directly towards Jay. "There he is. That is the man who killed my father." She pointed towards him and Jay could almost feel her radiated scorn and hatred. "I accuse that man of murder and demand the full punishment as laid down in the Ship's Code!"

The full punishment was agonising death.

To be concluded

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BOOK REVIEWS

The fears I expressed last month, concerning the apparent dearth of new significant science fiction novels, have been allayed to some extent by the appearance of two new books from a publisher of popular distinction, noted for perspicacity in fiction discovery. Messrs. Michael Joseph, in so launching their series of "Novels of Tomorrow" (for which seven titles are announced so far) sent in with the review copies a benediction from Miss Clemence Dane who is General Editor of the venture. Suitably awed by the aura of respectability invoked by this formidable combination, and favourably impressed by the format and tasteful design of the dust jackets, one must nevertheless look beyond the immediate advantage to the science fiction field of this superior form of presentation and judge the stories themselves by their self-imposed higher literary standards.

Harold Mead's *The Bright Phoenix* (Michael Joseph, 12/6d) is a 'first' novel of reasonable literary competence, but suffers in my own estimation from comparison with Margot Bennett's recent *The Long Way Back*, with which there is a marked similarity of theme. Inevitably too, Huxley's *Brave New World* and Orwell's 1984 are recalled to mind, since many of the ideas are used again here. Civilization has been reduced to an undefined State (presumably located in America) established after a fifty-year interregnum of barbarism which followed an atomic holocaust. The morbid tendency to absolute State control—with an Officer and a Worker class, kept in line by the Morality Police—is depicted with frightening realism. Marriage is controlled by the Ministry of Eugenics, which issues a 'B' licence only to qualified couples, and retains any issue for State education. But casual cohabitation is easily available under a simple 'A' licence. For religion there is only the fanatical worship of the Spirit of Man; for deviation from State reasoning there is the awful mindless limbo of Reconditioning. Against this background John Waterville, a junior State Officer who has returned from an exploration of the Island (Britain?) is selected to join the Colonisation Project for propagating the eugenically perfect new species of man in the bleak devastation of the Island. John, of course, is the sympathetic character on whom the veneer of the Spirit of Man is beginning to crack, and it is through his eyes that the story is told. The author is inordinately concerned

with the sexual aspect of this formidable new world, but withall it is a thoughtful novel, uncluttered by scientific gadgetry, which struggles hard to maintain interest despite weak characterisation.

Its companion is an ingenious science fiction novel *The Year Of The Comet* (Michael Joseph, 12/6d) by John Christopher, who has several fine straight novels to his credit and, as *New Worlds* readers will know, many excellent short science fiction stories. In fact this book is the logical development of the 'managerial' ideas we have met before. In this recognizable world of the future, national boundaries are as nothing (with the exception of isolationist Israel—for plot purposes, among other logical reasons) and the balance of power is held by huge business empires, or 'managerials,' of which Atomics, United Chemicals and Telecoms are the chief protagonists in a struggle to obtain the secret of a new power source. The young research scientist, Charles Grayner, becomes the centre for a bewildering series of intrigues and abductions played out against a background of religious fervour occasioned by the advent of a wandering comet. One important facet of future trends—the dismaying development of commercial television—is an amusing ingredient, and provides the major character, Dinkul, a delightful cynic and chief of a rapidly declining lone-world teleservice for thinkers only. The author uses his own wide knowledge, ranging from diamonds to music, to lend authenticity of detail, and combines an undoubted flair for story-telling with some thoughtful concepts and a pithy philosophy to produce an eminently readable novel worthy of your attention.

There is only one anthology this month (my remarks in the last issue appear to have had an opportune reaction) the second in the series by editor John Carnell, called *Gateway To The Stars* (Museum Press, 9/6d). All stories are by British authors, of course, and all but two are from *New Worlds* or *Science Fantasy*. Unfortunately the selection is very uneven, and the two odd stories hardly deserve resurrection, John Beynon's "Never on Mars" and John Christopher's "Conspiracy" being both well below these author's usual high standard. Among the familiar titles I prefer J. T. McIntosh's amusing (if a little confusing) "Stitch in Time," and two good examples of space adventure—Lan Wright's "Operation Exodus" and Alan Barclay's "Only an Echo." Ted Tubb's "Unfortunate Purchase" scores with a neat twist ending, and in "Assisted Passage" James White handles an unoriginal idea with some success. Gene Lees poses a human problem in "Stranger from Space" a gentle picture of a near-break-up of a spaceman's marriage, but Peter Hawkin's flounders in "Circus," an inept story of an unscrupulous owner of a space-menagerie, with unsuccessful attempts to depict alien creatures. In his foreword the

editor maintains that British science-fiction can hold its own with the American product. I go along with this sentiment, and even further in that the top few of our own authors are better than the average American writer, particularly when they avoid copying American style and idiom. But in all honesty this present collection is not convincing proof of superiority or even equality.

Six months ago when I reviewed William Dexter's first science-fiction novel *World in Eclipse* I felt that despite an outmoded tendency to clutter story-interest with unbelievable aliens, together with a complete disregard of modern scientific tenets, this author had possibilities. However it is sad to report that in the inevitable sequel, **Children Of The Void** (Peter Owen, 10/6d) Mr. Dexter has lapsed even further into a farrago of pseudo-scientific nonsense, without virtue of a plausible plot to make it halfway readable. Yet, infuriatingly, he has plenty of ideas (even if mostly unoriginal)—too many per story in fact, resulting in frequent desperately explanatory paragraphs as though reluctant to omit any idea from a hundred outworn plots which may serve to stun the unwary reader into accepting this as a criterion of modern science-fiction. This kind of writing went out with the crude pulps of the early thirties—later than which it is difficult to believe the author has any knowledge of the genre—and has only been resurrected in certain low quality paper-backed novels of recent bad memory. To which category I must reluctantly add *Children of the Void*.

By contrast it is comforting to know that science fiction has the support of such able writers as Robert A. Heinlein who contributes in **Assignment In Eternity** (Museum Press, 9/6d) four satisfying novelettes, two long and two short. "Gulf" shows Heinlein at his top level of excitement, with taut dialogue, and tense and brutal action. The plot is rather overpowering, starting with a government secret agent of the future returning from the Moon with microfilms of a new nova weapon which can destroy a planet. His job (as they say in "Dragnet")—to deliver the goods. But he runs foul of a power faction (evil) and is aided by a secret organisation of supermen (good). Even Heinlein has his work cut out to make this plausible, but who cares. "Elsewhen" explores the possibilities of parallel time-tracks, and "Jerry Was a Man" discusses the anthropological status of a mutated-chimpanzee.

Best of the book is the long story "Lost Legacy," again dealing with matters of the mind, in which three college people develop their mental potential in extra-sensory perception and become involved in another secret organisation who have reached the ultimate on thought control. The theme is repetitive but intensely fascinating, particularly when told with Heinlein's considerable charm and writing technique.

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